

5177.05

Am 3
D



Library
of the
Academy of Medicine,
Toronto.

3189

Presented by

1316





✻ THE ✻

AMERICAN JOURNAL

✻ OF ✻

OPHTHALMOLOGY.

VOLUME IX, 1892.



ST. LOUIS, MO.

PUBLISHERS, 914 LOCUST ST.

1892.

INDEX TO VOL. IX.

AUTHORS.

ORIGINAL ARTICLES.

Alt, A.,	-	-	-	-	-	-	-	I, 12; V, 149; XI, 341; XI, 351
Ayres, S. C.,	-	-	-	-	-	-	-	III, 65; XI, 339
Barnes, J. S.,	-	-	-	-	-	-	-	II, 33
Burnett, S. M.,	-	-	-	-	-	-	-	IV, 125, X, 297
Chisolm, F. M.,	-	-	-	-	-	-	-	VI, 161
Chisolm, J. J.,	-	-	-	-	-	-	-	II, 35; IV, 94
Dunn, J.,	-	-	-	-	-	-	-	II, 39; V, 234
Evans, T. C.,	-	-	-	-	-	-	-	VII, 225
Gifford, H.,	-	-	-	-	-	-	-	I, 1
Howe, L.,	-	-	-	-	-	-	-	V, 129
Mitchell, S.,	-	-	-	-	-	-	-	I, 11, XII, 371
Ryerson, G. S.,	-	-	-	-	-	-	-	I, 8; VIII, 193; IX, 280
Theobald, S.,	-	-	-	-	-	-	-	IX, 265

SELECTIONS FROM MEDICAL JOURNALS.

Baker, A. R.,	-	-	-	-	-	-	-	-	XI, 350
Bates, W. H.,	-	-	-	-	-	-	-	-	VIII, 259
Bull, Ch. S.,	-	-	-	-	-	-	-	-	I, 19; X, 318
Cohn, H.,	-	-	-	-	-	-	-	-	V, 150
Colburn, J. E.,	-	-	-	-	-	-	-	-	IV, 101
Culver, C. M.,	-	-	-	-	-	-	-	-	II, 51
Dabney, S. G.,	-	-	-	-	-	-	-	-	IX, 285
Denise, J. C.,	-	-	-	-	-	-	-	-	V, 154
Doenitz, W.,	-	-	-	-	-	-	-	-	II, 58
Douthwaite, J.,	-	-	-	-	-	-	-	-	XI, 368
Editor Medical News,	-	-	-	-	-	-	-	-	III, 88
Gould, G. M.,	-	-	-	-	-	-	-	-	VI, 186
Hinde, A.,	-	-	-	-	-	-	-	-	XI, 350
Hubbell, A. A.,	-	-	-	-	-	-	-	-	II, 44
Jeffries, J. A.,	-	-	-	-	-	-	-	-	XII, 374
Katamayama, K., and I. Kamoto,	-	-	-	-	-	-	-	-	X, 331
Keiper, G. F.,	-	-	-	-	-	-	-	-	IX, 290

Dr. Ayres' chalasion forceps, - - - - -	I, 12
Mucous patch of the conjunctiva, - - - - -	II, 33
Annual Report of the Presbyterian Eye, Ear and Throat Hospital of Baltimore City, - - - - -	II, 35
A case of dermoid cyst of the orbit, - - - - -	II, 39
Retinitis pigmentosa in the colored race, - - - - -	III, 65
The dislocation of an opaque lens. Nature's rare method of suddenly and painlessly restoring sight to a cataractous eye.	IV, 97
Concerning muscular advancement, - - - - -	V, 129
Note on Congenital nystagmus, - - - - -	V, 149
A case of recurrent œdema of the upper eyelids as a symptom of nasal polypus, - - - - -	V, 134
Thirteen cases of ichthyciriasis of the lids seen in one year, - - - - -	VI, 161
Unusual case of sympathetic blindness, - - - - -	VIII, 193
Congenital ptosis. Report of a case treated by Panas' operation, - - - - -	VIII, 225
Removal of a fragment of steel from the vitreous chamber by means of the electro-magnet with preservation of nearly normal vision, - - - - -	IX, 265
Consideration of some of the chronic and severer forms of dactyocystitis, - - - - -	IV, 270
The construction and use of the ophthalmometer. An explanation and correction, - - - - -	X, 297
Glasses on a child two years old for convergent strabismus, - - - - -	XI, 339
Some remarks on post-typhoid eye-affections, - - - - -	XI, 341
A case of acquired anterior polar cataract, - - - - -	XI, 357
Temporary vision restored to a sightless eye by an accident, - - - - -	XII, 371

SUBJECTS OF TRANSLATED AND SELECTED ARTICLES.

The treatment of blepharitis, of ectropium after blepharitis, and of ectropium senile and sarcomatosum, - - - - -	I, 13
Tumors of the orbit, secondary or consecutive to tumors of the neighboring bony cavities, - - - - -	II, 19
Optic neuritis as a form of peripheral neuritis, - - - - -	II, 44
Orthoptic training, - - - - -	II, 51
The action of tuberculin upon the experimental eye-tuberculosis of the rabbit, - - - - -	II, 58
The value of antipyrine in ophthalmic-therapeutics, - - - - -	III, 67
Eye strain and disease, - - - - -	III, 80
An anomalous action of the sulphate of hyoscyamine used as a mydriatic, - - - - -	III, 94
Keratitis bullosa, - - - - -	IV, 101
Syphilitic plastic iritis; gummatous iritis (papulosa); gumma of the iris; and Syphilitic serous iritis, - - - - -	IV, 111

A new instrument for quickly determining refractive errors of the eye, - - - - -	IV, 119
Spontaneous cure of detached retina, - - - - -	IV, 124
Notes on plastic operations about the eselids, - - - - -	V, 102
A picture of hereditary nystagmus, - - - - -	V, 146
The use of bichloride of mercury in the treatment of ophthalmia neonatorum, - - - - -	V, 150
Report of a case of total blindness, the result of brain tumor, diagnosis verified by autopsy, - - - - -	V, 154
Some cases of obstructive disease of the lachrymal passages and the associated intra-nasal lesions, - - - - -	V, 177
A simple method of treating many cases of lachrymal obstruction, - - - - -	VI, 186
Operation on microphthalmic eyes, - - - - -	VI, 191
Notes on spasm of the accommodation, - - - - -	VIII, 259
An overlooked factor in the production of conjunctivitis, - - - - -	IX, 279
Antisepsis in ophthalmology, - - - - -	IX, 285
Steel in the iris for twenty-seven years. Sympathetic inflammation. Operation. Recovery, - - - - -	IX, 290
Clinical history of a case of successful extraction of a piece of steel from the iris and lens by an iridectomy with subsequent absorption of the lens and recovery of normal vision, - - - - -	IX, 293
The prime etiological factor in glaucoma is constitutional, - - - - -	X, 304
Contribution to the subject of intra-cranial lesions with defects in the visual fields. Five cases with autopsies, - - - - -	X, 318
Toxicology of the male fern with special reference to the visual disturbance, - - - - -	X, 331
Infantile cataract, - - - - -	XI, 331
A case of toxic central amblyopia terminating in progressive atrophy; with general considerations, - - - - -	XI, 359
Traneplantation of an eyelid, - - - - -	XI, 368
Eye Paralyzes, - - - - -	XII, 374

NEWS AND EDITORIAL NOTES.

News, - - - - -	IV, 100; V, 140
Reviews, - - - - -	II, 63; IX, 268



THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

JANUARY, 1892.

No. 1.

ORIGINAL ARTICLES.

ON THE USE OF THIERSCH FLAPS IN THE
TREATMENT OF TRICHIASIS AND
ENTROPIUM.

H. GIFFORD, M.D., OMAHA, NEB.

At a meeting of the Missouri Valley Medical Society in March, 1891, I described an operation for trichiasis which at that time I considered to be new. I have since learned that a similar, though not exactly the same operation, was described by Jaesche years ago (Zehender's *Monatsblätter f. Augenheilkunde*, 1881, p. 40), but the short communication attracted little notice. Since my paper was read, Schroeder and Natanson (*St. Petersburger Med. Wochenschrift*, 1891, 17) have also described an operation differing but slightly from mine.

My method is as follows: After splitting the lid margin, as in the ordinary Jaesche-Arlt operation, another incision, through the outer flap, about $\frac{1}{2}$ cm. in length, is made at each extremity of the first incision, at an angle of about 45° to it, slanting toward the neighboring commissure. Three or four sutures are then put in to turn out the flap containing the lashes, and as the manner of introducing them is of consider-

able importance, I shall describe it at length later on. The sutures having been tied, the gap in the lid margin is filled with a flap shaved off from the arm, the razor passing just deep enough to cause the blood to flow after the flap has been removed. With a good razor and a little practice, it is not difficult to shave off a strip plenty large enough, in a single piece. I find the inner side of the forearm to be the place best suited for the removal of those flaps, on account of the greater ease with which a nearly flat firm surface can be obtained. In women, however, where it is desirable to conceal the scar as much as possible, I generally take the flap from the upper arm, the skin being drawn tense and the subjacent tissues rendered hard by grasping the arm firmly from the opposite side. The razor should be very sharp with a perfectly uniform edge, both it and the skin being kept wet during the operation with some aseptic liquid. When a broad enough strip has been cut, the skin must be pressed against the razor edge with a roll of wet cotton to complete the section. On the wet razor the flap is trimmed with the scissors, if necessary, and then slid directly from it into the gap in the lid margin.¹ It is well to have the bleeding as nearly stopped as possible, but where there is some obstinate oozing, no time need be wasted in trying to stop it before applying the flap, as the latter itself acts admirably as a hæmostatic. When the blood beneath it has been

Schroeder and Natanson (*loc. cit.*), in common with most operators who have made much use of Thiersch's flaps, mention the difficulty of preventing the flaps from curling up; they also seem to have had difficulty in applying the flap to the wound. As I have had no trouble in either of these ways, I feel like adding a few words on the technique. For cutting the flaps I always use a large razor, nearly flat on one side, which is kept constantly wet. When large flaps are needed as for ectropium (when I have found them to answer admirably), I have easily cut them from the leg and thigh 5 cm. long and 1 cm. broad. The section having been completed, the flap is slid to the toe of the razor and this end is pushed off with some fine instrument and held against the tissues at one extremity of the wound, while the still-wetted razor is withdrawn, the flap applying itself to the wound as fast as it leaves the razor. This transfer should be made as soon as possible after the flap is cut, for if it is left on the razor or anywhere else bathed in a watery solution, it soon begins to curl up; hence if there is more trimming to be done than a stroke or two of the scissors, it had better be performed after the flap has been applied.

pressed out by carefully forcing the flap down with a moist swab of cotton, the bleeding generally stops at once. No retaining sutures are necessary. After pressing the flap into close contact with the surface below, it is sprinkled well with iodoform, a small strip of cotton sopping wet with sublimate 1:10,000 is laid against it, a larger piece of wet sublimate cotton is placed over the whole eye, then a piece of gutta serena or oiled silk, more cotton and a binocular bandage. The dressing is changed after two days and then every day; the stitches are removed on the fourth day if they do not cut through sooner. The wet sublimate dressing is used to prevent the cotton from sticking to the flap. Perhaps a dressing with some ointment would do as well. The average width of the flap introduced is about 8 mm., and at first after healing there is some deformity, but as slight contraction always takes place, and as some of the flap is often turned in so as to apply to the surface of the eyeball, this always disappears, except occasionally at the corners, where there is sometimes a little projection which needs to be snipped off.

Regarding the manner of introducing the sutures, if the lid be split very deeply by the first incision, the outer flap can be turned out sufficiently by simply passing the needles, first, through the edge of the flap, then out, and then through another fold of skin higher up (or lower down), on the lid. But splitting the lid deeply has the disadvantage of leaving quite a gully between the outer and inner flaps, and the thin Thiersch flap must sink deeply into this depression if it is to grow. It is, therefore, desirable to throw the outer flap as far back from the inner as may be necessary, with as shallow an incision in the edge of the lid as is possible. To accomplish this the needles are first passed through the edge of the ciliary border, then out and over a small cylinder of cotton squeezed out of sublimate solution laid lengthwise of the lid, just outside of the cilia, then through another fold of skin just above (or below) the cotton splint. When a suture introduced in this way is tied, the effect is to press the cotton splint deeply into the lid, and thus roll the skin flap strongly outward. The cotton

for the splint is squeezed out of the sublimate solution and rolled into a firm cylinder of the length of the lid, about 4 mm. in diameter. In attempting to obtain the necessary eversion of the outer flap without the aid of the splint, I succeeded only in everting the entire lid with the production of very little gaping of the wound.

I was led to use Thiersch flaps in this manner after considerable experience with Van Millingen's operation of transplanting membrane from the lip into the split edge of the lid. The Thiersch flaps heal in better; they look more natural (a successful transplantation from the lip often giving an unpleasant reddish appearance to the lids); they are much more easily and quickly obtained and placed in position; and sutures are not necessary either for the flap or for the arm, while when lip is used, I have found stitches of advantage both for the flap and for the lip wound. This operation differs from the one originally described by Jaesche, both in the manner of applying the sutures to make the split in the lid gap, and in the addition of the short oblique incisions through the skin and muscles of the lid, at the extremities of the first lid-splitting incision. Both these points are of importance, as they insure a wide gaping of the wound in the edge of the lid throughout its entire extent and allow a wide enough flap to be introduced to guard against any possibility of a recurrence of the trichiasis, in all ordinary cases. It might be supposed that where the epidermis is pulled over so as to rub against the cornea, irritation would result, and to provide against this possibility, Raehlmann (*Deutsche Med. Wochenschrift*, 1891, 1), has proposed, for extreme cases, a double operation, transplanting first a piece of lip to rest against the eyeball, then later on a strip of skin from the upper lid, to widen the lid margin. This, however, is complicating matters unnecessarily. Although in some cases there seems to be a slight irritation, at first, as soon as the outer layers of epidermis cells become thoroughly moistened, the cornea bears contact with them as well as with mucous membrane. There is, however, one class of cases in which lip membrane is to be preferred to a Thiersch flap.

Where the trichiasis is the result of some injury or phlegmonous inflammation so that the lids do not protect the eyeball completely when closed, the greater thickness of tissue which can be transplanted from the lip gives it the advantage. The Thiersch flaps contain, of course, no hair bulbs, and hence are not open to the objection raised against skin flaps from the upper lid and temple, namely, that the lanugo hairs which they contain often cause as much irritation as the original displaced cilia.

The only cases in which I have found it necessary to repeat the operation or to use additional measures to insure a permanent result have been those with very extreme contraction of the conjunctiva and much thickening and incurving of the lid. In two of these the flaps healed on perfectly, but the thick stiffened lids simply rolled them in against the eyeball to supplement the deficient conjunctiva, and it was necessary to repeat the operation on four lids, and on two, in addition, to excise a strip of muscle and turn the lid out by deep sutures. Where, from extreme conjunctival contraction, the skin containing the cilia is so stretched that the inner rows of lashes turn in much more sharply than the others, it is good practice to excise a strip of skin containing the bulbs of the former, before putting in the flap (this approaches the single operation described by Franke in *Hirschberg's Centralblatt*, June, 1890).

I have done the operation 28 times, with good results in all cases except those just referred to. Regarding the permanence of the results, the operation will not, of course, prevent further shrinkage of the conjunctiva if the trachoma has not been cured, but aside from this, the flaps after contracting to between four-fifths and three-fifths of their original width, in the course of the first month or two, reach a definite size which undergoes no further change, and which leaves ample room between the lashes and the eyeball.

I generally use chloroform for the operation, but by injecting cocaine at three or four points of the lid border, the first incisions can be rendered painless; while by spraying the skin

with ether not quite to the freezing point, I have shaved off the Thiersch flaps almost painlessly, without any noticeable impairment of their vitality. In unusually sensitive patients a combination of ether spraying with intra-dermal injections of cocaine, as recommended by Schleich, would probably be desirable. I have lately tried this method on myself and can vouch for its absolute painlessness.

II.

Another operation for entropium and trichiasis, which I have performed in several cases, is a modification of von Burow's, differing from it, however, in important particulars. An incision is made nearly through the tarsal cartilage from the under side parallel to the lid margin 2-4 mm. from the openings of the Meibomian glands, of a length corresponding to the incurved portion of the lid. From each extremity of this incision a shorter cut through the tarsus is made at an angle of 45° with it, slanting toward the neighboring commissure and ending between the cilia. The edge of the lid thus loosened is turned back by three or four sutures arranged over a splint as in the operation just described. The gap thus made in the under surface of the lid is filled by a Thiersch skin-flap, or by a piece of lip-membrane without the use of stitches. Iodoform is dusted over the flap and the same wet dressing and after-treatment used as described above. Theoretically this is the ideal operation for entropium, inasmuch as it restores the natural curvature of the lid by introducing new tissue at the point where the disease has destroyed the natural membrane. I have done it seven times with good results, except in one case where lip was used, and where, through a mistake of the nurse, a pervious plaster was used to cover the wet dressing, instead of oiled silk or rubber. In this case the cotton next the flap dried completely, and on removing it the piece of lip came with it. One might, *a priori*, suppose that lip membrane would be far preferable to skin, for this operation, but I have found the skin, eventually, to answer perfectly. Until the first layer of epidermis has peeled off there is, in some cases, considerable irritation of the cornea, but this is only

temporary; after a week or so the cornea bears contact with the skin graft without reaction. To shorten the period of irritation following the operation, it is well to pare off any superfluous non-adherent edges of the flap, and to gently scrape off the upper epidermal layers as soon as they become loose enough to be easily detached. In addition, I generally begin the use of the sulphate of copper crystal on the fifth or sixth day. This I have found to be important, as the operation and the bandaging generally stir up an inflammation of the lids which helps irritate the cornea, even where, before the operation, the trachoma seemed to have run its course completely. Just what the scope of the operation will be cannot as yet be said. I have not tried it on any extreme cases, nor upon the lower lid. It has the advantage, over all operations in which the lid border is split, of leaving no doubt as to which side of the incision all the hair bulbs lie on. It can, moreover, be done under cocaine, without even the pain necessary to the introduction of the hypodermic needle into the lid. If the lid be held everted with a lid clamp, and a bit of cotton soaked in 20% cocaine solution be left lying along the line of the proposed incisions for 8 or 10 minutes, the cutting causes no pain worth mentioning. The lips can be anæsthetized in the same way if lip membrane be desired for the flap; or the ether spray, with cocaine injections, can be used to deaden the skin for obtaining a Thiersch flap. The advantages of closing the gap in the lid with a graft instead of allowing it to close by granulation, as done by von Burow and Green, are obvious. The short oblique incisions through the tarsus which I have added, greatly increase the effect of the von Burow tarsotomy. The excision of a narrow strip of skin from the upper lid I have not found necessary. The use of the cotton splint for making the wound gape widely is not so important, in this operation, as in the preceding. The lid wound can be made to gape sufficiently without the splint, but with it, in addition to the gapping produced, the lid is rolled out so that the dressing can be applied with greater accuracy, directly to the flap which closes the wound.

CASES OF TRAUMATIC HÆMORRHAGE INTO THE EYEBALL WITHOUT LESION OF THE EXTERNAL TUNICS.

BY G. STERLING RYERSON, M.D., L.R.C.S., EDIN.,

Professor of Ophthalmology in Trinity Medical College, Toronto.

Cases of hæmorrhage into the globe of the eye, the result of trauma, are not very common, and as much interest attaches to the prognosis and treatment, I feel justified in putting the following cases on record:

CASE I.—M. J., æt. 29, hotel clerk, French Canadian, was opening a bottle of double soda water on January 3, 1888, when it exploded prematurely and struck him in the right eye. When I saw him an hour later the anterior chamber was almost entirely filled with blood; could not even discern light; tension slightly increased, pain severe. There is no lesion of the cornea beyond a slight abrasion. Warm belladonna fomentations were ordered, under which and atropine pain subsided. There was not at any time much conjunctival injection. Hypodermic injections (5 minims of a 2% solution of pilocarpine nitrate) into the temple were begun. Every third day two leeches were used, and free bleeding from the bites was encouraged by spraying with warm water.

In four days the anterior chamber was nearly clear of clots and there was some perception of light. At the end of six weeks, V. = V_{LXX} . The pupil was still dilated, though atropine had been stopped for three weeks. Eventually the vitreous quite cleared up, the pupil regained its normal size, but was somewhat sluggish, and very fair vision was regained at the end of eight months.

CASE II.—On August 3, 1891, R. M., æt. 14, was brought to me, having been struck that evening on the left eye with a stone. Vision reduced to perception of light; no great pain. The anterior chamber was nearly filled with blood clots; no external wound of eyeball, but eyelid was bruised and lacerated. Ordered bleeding and atropine. The hæmorrhage proved to be entirely in the anterior chamber, as under this treatment, aided by half a dozen hypodermic injections it cleared up in about two weeks and the eye seemed quite restored in six weeks' time. $V.=^{15}/_{xx}$.

CASE III.—J. A. R., æt. 6, was brought to me from a neighboring town on May 9, 1891. He had been hit in right eye by a small bullet from a toy spring gun four days previously. Vision was *nil*. The iris could be dimly seen at the margins of the cornea. The blood was of a bright hue; tension $+1$; considerable pain and swelling of eyelid; no external lesion of the eyeball. On account of the increased tension, I determined to evacuate the anterior chamber, which was done the following day under an anæsthetic. Quite a smart flow of bright blood followed the incision of the cornea. The clots still remained in the anterior chamber, I not being able to remove them with forceps, or by gentle pressure. I felt that the eye was lost when next day I found no improvement of sight, tension as before. The father, however, was most anxious to save appearances and urged me to do what I could to avoid removal of the globe. I accordingly put him on the pilocarpine injections and used leeches frequently. The clots gradually cleared up, and on June 5, he could see large objects. There was still a rusty deposit on the posterior surface of the cornea. By July 10, the vitreous had pretty well cleared up.

The child was put on iodide of potash and sent home. I saw him again November 7; the eye was apparently quite as good as the other in appearance, but the pupil was somewhat larger and sluggish. Vision $R.=^{15}/_{xxx}$. I might remark, in passing, that atropine should not be used frequently during the pilocarpine treatment. It is better to instill it an hour after the injections where its use is deemed necessary.

Leeching *before* the injections tends to increase the absorbi-facient action of the pilocarpine. It is also well to cause the patient to lie quietly in a darkened room after both leeching and injections. Too early exposure to light causes sudden increase of vascularity. The dose required to produce mild diaphoresis will vary with individuals. I prefer to inject in the temple because the soreness left by a number of injections acts as a counter irritant.

CASE IV.—E. L., æt. 24, club waiter, came to me November 11, 1891, stating that he was opening a bottle of apolinaris two days before when the cork unexpectedly struck him in the eye. The anterior chamber was full of blood. V.=perception of light. He said that he had seen two other oculists, and that they had told him that there was no hope of saving the eye, and that he had better have it removed. I put him on the treatment used in the other cases and to-day, December 2, the anterior chamber is free from clots. The vitreous contains a few rather large floating opacities, which, I have no doubt, will eventually clear up.

REMARKS.—These cases are examples of rupture of intra-ocular vessels either in the iris or choroid without lesions of the external tissues, discoloration or other injury to the lens, or detachment of retina.

I have observed several cases of rupture of the choroid, and it is curious to notice that hæmorrhage into the vitreous is rarely present. In one case of extensive rupture I saw in the clinic of my late friend and tutor, Prof. Becker, in Heidelberg, there were floating opacities in the vitreous which were believed to be the remains of clots, but as the case was not seen at the outset, they might have been due to disturbance in the nutrition of the vitreous or to effusion. It is very difficult to formulate a theory which will satisfactorily explain why blows on the eye of apparently equal force should produce so many different lesions. I have never been able to detect the exact source of the bleeding. It is, however, gratifying to be able to say that free leeching and the hypodermic use of pilocarpine nitrate will, in almost all cases, bring about a satisfactory result.

SPASMODIC MYDRIASIS A SEXUAL NEUROSIS.

BY S. MITCHELL, M.D., HORNELLSVILLE, N. Y.

I have recently had under observation five cases of spasmodic mydriasis, two male and three female. They were all under 40 years of age, and in each case I was able, to my own satisfaction, to trace the origin of their disease to an irritation, or at least an over-excitation, of the sexual apparatus.

The two male cases were young men under 25 years of age, both busily engaged in paying suit to their future wives, and as both were of an amorous disposition, but strictly virtuous, they were in a position to have their sexual appetite frequently stimulated and not appeased, a condition of affairs nicely arranged to produce an endless variety of neurasthenic symptoms.

The three female cases were all married, but two of them had separated from their husbands, and all were living lives that were far from virtuous, and each being of a neurotic temperament, they were by their mode (or rather *demi-mode*) of living, in an excellent position to become the victims of almost any neurotic disorder. Thus in all five cases having an effect similar in every particular, it was very natural to suspect that the cause in each was the same, viz., irritation of the sexual apparatus.

There was a refractive trouble in but one case, and that was one of the female cases, where .75 D hyperopic astigmatism, according to the rule, was found to exist in both eyes. The correction of this gave entire relief from former headache, but did not have any effect upon the attacks of mydriasis, which would return with their wonted frequency. In every

case except one the trouble was with but one eye at a time, alternating from one to the other.

The treatment employed was pretty much all on the expectant plan, and to correcting any errors of the general health found to exist. The two young men speedily and entirely recovered after marriage. The female portion of the group have all drifted away from this place and from my observation. I have no doubt, however, that if the moral tone of their lives still continues to be lax, the ciliary muscles of each with a corresponding lack of physical tonicity still continue to have their usual periodic spells of relaxation from the even tenor of their ways.

NOTE ON DR. S. C. AYRES' CHALAZION-FORCEPS.

BY ADOLF ALT, M.D., ST. LOUIS.

The accompanying cut is that of a little instrument which Dr. S. C. Ayres had made in order to better squeeze out the chalazia. I have tried the instrument in a number of cases



of hordeolum after the incision and in a few cases of chalazion and have found it to be a very nice and useful addition to our armamentarium. I recommend it to our colleagues.

TRANSLATIONS.

THE TREATMENT OF BLEPHARITIS, OF ECTROPIUM AFTER BLEPHARITIS, AND OF ECTROPIUM SENILE ET SARCOMATOSUM.

BY V. FUKALA, M.D., PILSEN-KARLSBAD.

Translated by A. ALT, M.D.

The treatment of blepharitis is by no means as simple and easy as it is described in many ophthalmological works. Aside from trachoma there is no other eye disease which defies every treatment for so long a time as does blepharitis, and often when it appears to be healed, as in trachoma this is, as a rule, only for a short period and the disease soon returns. Thus blepharitis will often last for decades, nay even through a whole life time, and although there may be times of improvement there is no lasting cure. Blepharitis, therefore, as Fuchs says in his text-book, is an eminently chronic disease. Where to look for the cause of the obstinacy we do not know; although blepharitis but seldom does any serious harm to the eyes, it at least mars their looks considerably and the patients may often be recognized from afar by their red lid margins and the stillicidium.

At present we differentiate only between two kinds of blepharitis, namely, one without ulcers, blepharitis squamosa, and one with ulcers, blepharitis ulcerosa. In the first form the skin around the cilia is reddened and here and there covered with small scales. In the second, the skin is sore and around

the cilia shallow or deep ulcers are found which are covered by pus and dried crusts. Both forms are only different degrees of one and the same pathological process and may be found side by side. For the older division of blepharitis in a glandularis, ciliaris, solitaris, tylosa, etc., we have no uniform basis, since it takes into consideration on the one hand the different phases of one and the same pathological process, and on the other hand the symptoms that are most apparent. The main role in the treatment has been played of old by the 3% ointment of the red precipitate of mercury and the remedy is praised as infallible; this is not, however, true, and the ointment can only produce an alleviation but no true cure. We have to make the same statement in regard to the white precipitate of mercury, although it acts much milder than the red. Some authors consider the blepharitis an eczema of the skin of the lid and in consequence use Hebra's diachylon ointment by spreading it on linen and laying it on the lids (Michel, *Lehrbuch der Augenheilkunde*) I have seen better results from compresses soaked in liquor plumbi acetici as Schweigger in Berlin uses it. He puts 10 drops of the solution in a cup of water and applies the compresses soaked with it to the lids for half an hour two or three times during the day. Schiess-Gemuseus and Saemisch¹ examined the roots of epiated cilia from lids affected with blepharitis and found the bulbi swelled and the roots and shafts diseased. Since then they epilate the cilia as we do in sycosis. This does not agree perfectly with what Weichselbaum² found.

His experience is that even in intense ulcerous blepharitis the hair bulbs and papillæ are often perfectly intact and are but secondarily affected in consequence of the inflammatory process. The surest remedy in order to cure every kind of blepharitis is the pencil of mitigated silver nitrate. I use only

¹Schiess-Gemuseus Beiträge zur pathologischen Anatomie des Auges. Virchow's Archiv für pathologische Anatomie, Band 27, Heft I. and II., Seite 132.

²Pagenstecher, Saemisch und A. Pagenstecher, Klinische Beobachtungen aus der Augenheilanstalt zur Wiesbaden zweites Heft.

³Archiv für Augenheilkunde, XXIII. S. 367.

the very thin and finely pointed pencils with which I touch the inflamed lid margin. In cases of blepharitis ulcerosa the dried crusts must first be soaked with warm water and be carefully removed before the application. The next day the blackened crusts are again soaked and removed and a further application of the pencil is made. This procedure is continued as long as there are any traces of disease of the lid margin, namely redness or ulcers. In order to mitigate or to remove the pain caused by the pencil, the lid margin may first be brushed with a cocaine solution of from 5 to 8%. By this method of treatment I have almost always seen a lasting cure. In some forms of ulcerous blepharitis in adults with consecutive ulcers of the cornea and intense catarrhal inflammation of the conjunctiva which could not be cured by the method just detailed I have succeeded in bringing about a rapid cure by removing the external edge of the lid-margin according to Flarer.³

The Post Blepharitic Ectropium aside from that following burns and caries is the most frequent form of ectropium. This is due to the frequency of blepharitis among younger and older people. Since the inflammation of the lid margin obstinately resists the treatment and recurs with particular frequency it favors a series of consecutive affections. The irritation of the conjunctiva contributes to increase the number of ulcerations on the lid margins; this by reflex action is followed by an increased lachrymation, in consequence of which the tears are not carried to the nose by means of the drainage apparatus but run over the lid margins down the cheek. When this stage is once reached the lower lid can no longer return to the norm.

There are two circumstances which under such conditions particularly bring about the formation of an ectropium. The lower punctum lachrymale is everted from the lacus lachrymalis and the normal drainage of the tears is soon almost totally stopped. From this, at first slowly, later on more rapidly, a second affection is developed, namely, an acute dermatitis of

³Knapp-Schweigger's Archiv. für Augenheilkunde, XXIII, Seite 364.

the lower lid and cheek which after some time becomes chronic, and thus by the shrinkage of the skin ectropium of the lower lid takes place which baffles every form of medication. Not alone ointments and collyria but likewise operative procedures are useless against this ectropium. Since it is so frequent an affection a series of different operative methods have been made use of in order to cure it and this alone proves that such an ectropium is with difficulty cured.

For two years I have made use of a method against this ectropium which has shown itself successful in every respect. *According to the well-known Von Graefe's method⁴ the skin of the lid is loosened from the tarsus all along its margin and then the margin of the tarsus with the tarsal conjunctiva is stitched to the skin of the lid, but lower according to the degree of the ectropium.*

After the skin has been loosened from the tarsus, which can only be done during narcosis a triangular piece of skin is removed from the outer angle after the manner of von Graefe. As by this means the usually elongated lid margin is to be shortened it is evident that the width of the excised triangle must correspond to the degree of elongation of the lid.

The sutures are placed in the same manner as in Snellen's thread operation.⁵

The needle is at first introduced near the outer angle and about 4 mm. below the lashes from the skin of the lid and vertically through the new formed wound lip and then passed at a corresponding point (that is just as far from the angle) but *close to its upper margin* through the tarsal tissue toward the conjunctival sac. Then the needle is returned through the cartilage, several millimeters inward and brought out through the skin at a point from 3 to 5 mm. lower; entrance and exit in the tarsal tissue lie at the same height as they do in the skin. Finally the threads are tied over a bead or a roll of adhesive plaster and *thus the tarsus is fastened to the skin below*

⁴Archiv für Ophthalmologie, IV, II Theil., S. 201.

Klinische Monatsblätter für Augenheilkunde, 1872, S. 36.

the lid margin. Three or four such sutures are introduced by the side of each other and they are allowed to remain from three to four days.

They are borne without any reaction. Bandage. The immediate effect of this operation is that the ectropionized portions of the conjunctiva and the tarsus are attached to a lower portion of the skin of the lid; and, since there are two wound surfaces in close contact, a lasting union must ensue.

This method of operation differs from the one von Graefe used in that the loosened skin and the tarsus can be exactly adapted to each other *according to the wish of the operator* and are held in that position and forced to grow together by the sutures. In von Graefe's method the union is dependent on and may be interfered with by all sorts of casualties. He tried to prevent the retraction of the skin-flap by threads which were fastened to the forehead. This has, however, but little effect, since the tension of the skin causes disagreeable sensations and later on such pain, that the patients insist on the removal of the threads. Furthermore, the stretching of the flap produces swelling and other disagreeable conditions. Secondary shrinkage later on draws the usually inflamed skin downward and thus a relapse is produced. In one word this method does not prevent relapses. Samson's method, in which a triangular flap, point downward, is loosened and stitched higher up, is not effectual enough, since this flap shrinks, and thus a relapse is brought about. My method is even more certain than Snellen's thread-operation. The latter does not insure against relapses, since after the threads have been removed, the lid returns to its former position.

From the foregoing, my method is a combination of the methods of von Graefe and of Snellen. The shortcomings of the one method are supplemented by the advantages of the other.

In von Graefe's method the wound surfaces are not stitched together and in Snellen's method there is no union of two wound surfaces and yet it will only be possible to cure ectropium when these two factors are simultaneously at work.

Ectropium Senile and Sarcomatosum in old people takes its origin from the loss of tone of the orbicularis palpebrarum muscle and from trachoma or chronic conjunctival catarrh when these diseases produce a considerable swelling of the conjunctiva.

It is well known that these forms of ectropium are difficult to cure because they are very apt to relapse. I operate these ectropia with perfectly certain success *by excision and subsequent stitching of the lid margin to the conjunctiva*. This method is absolutely certain since relapse is impossible and it moreover has the great advantage that it is easily performed. It does not interfere with lid movements later on and does not produce tear dropping. I at first loosen the tarsal tissue from the skin of the lid in the intermarginal portion, then with the scissors a cut is made through the conjunctiva parallel to the lid margin by means of which the ectropionised portion is removed. Finally the conjunctiva is united to the lid margin by four or five sutures. I have observed patients for two years after they had been operated on by this method and can be perfectly satisfied with the success. The secondary contraction of the scar considerably helps to shorten the elongated lid margin.

The combination of the two methods has also a great advantage in certain cases. Twice it has happened to me that in operating according to the first method I transplanted the tarsus and conjunctiva not quite low enough, and thus a small degree of ectropium remained behind as may happen now and then. In these cases I excised the remaining partial ectropium according to the second method. The insult was trifling and the success perfect. In all such cases this procedure has shown itself to be certain, simple and without danger.

SELECTIONS.

TUMORS OF THE ORBIT, SECONDARY OR CONSECTIVE TO TUMORS OF THE NEIGHBORING BONY CAVITIES.¹

BY CHARLES STEDMAN BULL, M.D.,

Professor of Ophthalmology in the University of the City of New York; Surgeon
to the New York Eye and Ear Infirmary; Consulting Ophthalmic Surgeon
to St. Luke's Hospital and to St. Mary's Hospital for Children.

In considering the subject of tumors involving the orbit, it is important to distinguish between those tumors which originate in the orbit, either in the orbital tissue itself, the sheath of the optic nerve, or the periosteum of the bony walls, and those which arise in some one of the bony cavities, and which involve the orbit secondarily. This distinction is important, not only from the diagnostic standpoint, but also from the side of surgical interference; for the location and extent of a growth involving the orbit frequently decide not only the question of an operation, but also the nature and extent of the operation itself. Many of the so-called orbital tumors arise in the ethmoid cells, the sphenoid antrum, the frontal sinus, the naso-pharynx, or maxillary antrum. It is a well-known fact that tumors of the bones of the skull or of the sinuses contained within these bones may, and generally do, extend in every direction from one sinus or labyrinth to another, and often exist for a long time and reach a large size before appearing in the orbit. The growth of these tumors is generally

¹Read before the New York State Medical Association at its Eighth Annual Meeting.

slow and insidious, though occasionally it is exceedingly rapid. A very extensive disintegration of the ethmoid, sphenoid, and maxillary bones from tumors starting in their respective sinuses may have already occurred before the presence of such a growth is manifested in the orbit by the usual signs of protrusion or displacement of the eyeball, pain on pressure along the orbital walls, or directly backward, and the visible or tangible presence of the growth itself within the orbit.

These tumors, in the literal, narrow sense of swellings, may be either fluid or solid. The former almost always arise in the frontal sinus or ethmoid cells, and contain pus or mucus. The latter are either solid or densely gelatinous, and are always malignant in character, and arise in the maxillary, sphenoid, or ethmoid antrums. Finally, a by no means uncommon growth in this locality is a bony tumor or a real ivory exostosis arising from the bony walls surrounding the orbit. A brief glance at the anatomical relationship of the bones at the base of the skull will enable us to understand more clearly the nature of these growths and the important relations they bear to the cavity of the orbit and its contents.

The *frontal sinuses* are situated within the frontal bone at the level of the nasal boss of that bone, just above the root of the nose. They are usually two in number, separated by a more or less complete partition of bone, which is generally, though not always, in the median line. Their dimensions are very variable, but their size usually increases with the age of the patient. Their form is very irregular. The anterior wall is the thickest, while the cranial and orbital walls consist mainly of compact bony tissue, with a thin layer of cancellous tissue in the center. Each frontal sinus opens into the infundibulum of the ethmoid by a canal in the anterior cells of this bone, and called the frontal or frontal-nasal canal. Each sinus is lined by a thin, smooth, rosy mucous membrane, slightly adherent to the bone, and consisting of two layers—one mucous, the other periosteal.

The most frequent diseases met with in the frontal sinus are:

First, mucocoele, or a collection of mucous; and, *second*, abscess or empyema. Empyema or abscess of the frontal sinus is usually an affection of adult life, though it is met with most frequently between the ages of twenty-five and thirty. It does not occur in childhood, as the sinuses are not developed to any extent at this period of life. It is found oftener among men than women, and this is probably due to anatomical peculiarities, such as the following: The sinuses are much more developed in men than in women, the infundibulum is wider and communicates more directly with the nasal fossæ, and through the latter with the external air. Hence infectious agents may more easily enter them. The left frontal sinus is more frequently attacked than the right, and the cause of this is as yet unknown. It is not uncommon to find, at the time of operation, that the suppurative process began in one sinus, perforated the bony septum, and involved the other sinus secondarily.

The *etiology* of suppuration of the frontal sinuses is somewhat obscure. It has been attributed to *tuberculosis* and *sypilis*, but this is not strictly correct. Both these constitutional affections may produce an osteo-periostitis of the frontal bone, accompanied or followed by extensive caries or necrosis and profuse suppuration, and the frontal sinus may be invaded by the pus, but always in the direction from without inward. The same argument applies to *erysipelas*, though here it must be admitted that the diseased process might extend through the mucous membrane of the nasal fossæ to the infundibulum, and thence to the frontal sinus. The sinuses have also been known to suppurate during the decline and convalescence of scarlatina and typhoid fever, and during a severe attack of influenza. Wounds of the superior orbital margin may possibly produce abscess of the sinuses, but only after a lapse of time, the diseased process extending gradually through the bone. Foreign bodies, whether inert or alive, on entering the nasal meatus and penetrating to the sinus, may set up a chronic suppurative process. Inflammatory lesions of the mucous membrane of the nasal fossæ are found to exist in many

cases of abscess of the frontal sinus. Finally, polypi of the nasal fossæ have been known to precede the development of abscess of the sinus.

All these are, of course, mainly predisposing causes. In order that suppuration should occur in a frontal sinus, there must be an entrance and proliferation of pyogenous microbes in the cavity of the sinus. The latter may penetrate directly into the sinus without affecting the nasal fossæ, or the suppuration of the sinus may be induced by that of the nasal fossæ. In the latter case, infection of the sinus may occur through the frontal canal or infundibulum, or by way of the lymphatics. Once invaded by the microbes, the mucous membrane of the sinus swells and becomes thicker, and thus the canal of the infundibulum is narrowed and eventually obliterated. Then the pus begins to accumulate in the sinus. In simple catarrh of the sinus the infundibulum becomes closed, but here the result is an accumulation of mucus, and not of pus. If this is to become an abscess, there must be a second element of an infectious nature present. When a sufficiently large opening has been made into the sinus and the pus has been discharged from the abscess, the mucous membrane lining the sinus is seen to be red and inflamed, swollen and thickened, sometimes to ten or twelve times its natural thickness. Its surface is rough, granular, and even fungoid. Large quantities of these fungoid excrescences may be removed with a curette, or destroyed by the injection of some caustic. The disease may perforate the bony wall of the sinus naturally, usually the inferior wall, but always by a small opening; or it may perforate the cranial wall and enter the cavity of the skull. Here the dura mater usually limits the extent of the abscess. Sequestra of bone are not uncommon, but they are usually very small and float freely in the pus. When these cases yield rapidly to treatment they are of two kinds; either the abscess has been a recent one, which has produced superficial lesions of the mucous membrane, or there has been extensive necrosis. In the latter case the frontal and orbital walls of the sinus have been cast off, the cavity of the

sinus has disappeared, and cicatrization has followed, leaving a deep pit or hollow in this region. The *diagnosis* is difficult, especially in the beginning.

Guillemain thinks there is only one constant symptom, the supra-orbital pain, which is sometimes intense. But I have known cases of abscess of the frontal sinus in which there was never any pain at any time during the development of the abscess. The disease usually resists all medication, and only disappears when the pus is evacuated. If with the pain there is coryza, ozæna, or a purulent discharge from one nostril, and the frontal boss is painful and protuberant, and if the eye is displaced downward and outward, the lesion is almost certainly in the sinus, though it may not be an abscess. Hence in these cases a thorough anterior and posterior rhinoscopic examination should always be made. At a more advanced stage of the malady, when the orbit is involved, the diagnosis may be still more difficult, unless the disease is of the acute variety, when there may be some of the signs of inflammation present. Still, even here, while there may be displacement of the eye downward and outward, there is rarely any protrusion of the eye forward. A small orbital abscess, lying behind the tendon of the orbicularis muscle, compressing the canaliculus and causing epiphora, might be confounded with abscess of the lacrymal sac, but if a probe can be passed into the sac the latter possibility is excluded.

Treatment.—If we are sure that an abscess of the frontal sinus is present, the indications are to open it as soon as possible, drain it carefully and inject antiseptic solutions, and thus put a stop to the suppurative process. The incision should be made, starting from near the inner canthus, immediately beneath the superior orbital arch, directly outward, and from an inch and a half to two inches long, so that if the bony wall of the sinus, which is here very thin, has not already been perforated, it may be easily opened. The pus then flows out, and the sinus should be thoroughly washed out with a solution of mercuric bichloride (1 to 1,000). The opening should be large enough to admit the little finger, and the cavity of the

sinus should be carefully examined for fungoid granulations or osteophytes, and these, if found, should be thoroughly removed. Then the septum between the sinuses should be examined for a perforation, for in some cases this partition wall has been found not only perforated, but nearly entirely absorbed. A drainage-tube should then be inserted, and the cavity carefully washed out twice daily. The re-establishment of the channel of communication between the sinus and the nasal fossa is sometimes advisable. This may be done by opening into the ethmoid cells by chisel or mallet, or by trephine, or by introducing a catheter through the fronto-ethmoidal canal and then a drainage-tube through the nose, after the plan advocated by Panas. After the opening of the sinus along the orbital margin, the first thing necessary is a thorough irrigation of the sinus. After the pus ceases to be discharged through the drainage-tube, the cavity generally begins to granulate from the bottom, and in from three to four months the cavity has usually been healed.

The Ethmoid Cells or Labyrinth.—The air cells or spaces of the ethmoid form a pneumatic labyrinth, which increases in width from above downward. From the uncinate process to the cavity of the skull the ethmoid is pushed into the cavity of the nose. Anteriorly it is connected with the lachrymal bone, and posteriorly it is often connected with the orbital portion of the palate bone. The posterior ethmoidal cells and the cavity of the sphenoid bone open in the upper nasal meatus. In rare cases the ostium maxillare is absent, and the maxillary antrum communicates with the ethmoid cells and sphenoid antrum. Sometimes the ethmoid labyrinth sends processes into the frontal sinuses, and occasionally the lateral ethmoid cells project very markedly toward the orbit.

The Sphenoidal Sinus or Antrum.—The anterior, posterior and lateral walls of the sphenoidal antrum or sinus are always thin, and sometimes very thin. The anterior wall may be entirely wanting and then the sphenoid sinus opens into the ethmoid cells. The hollow spaces in the ethmoid and sphenoid bones are by some regarded as a respiratory organ for the an-

terior and middle fossæ of the skull. However this may be, the anatomical relations between ethmoid and sphenoid are so intimate that any chronic process, such as a morbid growth, starting in the sinus or cells of either bone, is almost certain to involve the other at a comparatively early date.

The *symptomatology* of the diseases of these bony cavities in the vicinity of the orbit is always perplexing, and a diagnosis is thus rendered extremely difficult. In inflammation of the frontal sinus pain is sometimes felt in the region of the inner or nasal end of the eyebrow. In inflammation of the maxillary sinus, pain is usually felt in the infra orbital region. In inflammation of the ethmoid cells or sphenoid antrum, positive subjective symptoms are wanting. Inflammation of the mucous membrane of these adjoining cavities can by no means be readily distinguished from inflammation of the bony walls of these cavities. In intense suppurative inflammation the periosteum suffers also, and this may lead to necrosis. It is probable that in many cases of nasal disease in which orbital abscess is observed the inflammatory process extended from the nose to the ethmoid cells, and thence to the orbital tissue. The reverse may also be the case, the disease starting in the orbit and extending to the ethmoid cells and thence to the nose (see Vossius, *Archiv f. Ophthalmologie*, xxx, 3). Collections of pus in the frontal sinus may lead to orbital abscess, and even to abscess of the brain through the medium of the ethmoid cells. An inflammatory process may extend from the maxillary antrum to the ethmoid cells, orbit and brain (see *Edinburgh Medical Journal*, May, 1866), the walls of the ethmoid cells here becoming absorbed by pressure from the abscess. In caries of the lamina papyracea the subjective symptoms are dull pain, increased by pressure in the neighborhood of the diseased bones and vertigo. Redness of the lids at the inner canthus may be present. A hard tumor may be felt at the inner canthus, and later occur fluctuation, strabismus, diplopia, exophthalmia, limitation of the movements of the eyeball, and vision becomes reduced.

Owing to defective closure of the lids, ulceration and per-

foration of the cornea may occur, followed by phthisis bulbi.

In all cases of inflammation the opening of the ethmoid cells, evacuation of pus and the removal of fragments of carious bone are justified, especially if it is supposed that pus has formed. There may be indications also for opening the neighboring cavities, such as the frontal sinus, the nasal meatus, the sphenoid and maxillary antrums.

In *mucocele* of the *ethmoid cells* the symptoms are a gradual painless development of a tumor on the inner wall of the orbit, which later shows signs of fluctuation. The eye is pushed forward and outward and sometimes downward. Until fluctuation appears, it may be confounded with an osteoma growing from the inner wall of the orbit. Puncture or incision of the tumor will decide the diagnosis. It is very often connected with a similar condition of the frontal sinus, but it may proceed directly from the nasal meatus.

Naso-pharynx.—*Polypoid* growths in the naso-pharynx may extend into the ethmoid cells. They may possess a partly cartilaginous consistency. It can not be definitely determined whether all the visual defects which occur in polypi of the naso-pharynx are caused by pressure of the after-growth on the optic canal, or in the ethmoid cells, and thence against the inner wall of the orbit. Whatever the cause, the loss of vision is due to pressure on the optic nerve.

Enchondroma of the *ethmoid* is very rare, and always starts from the base of the skull.

Polypi originating in the ethmoid cells and confined within these limits are relatively rare, but nasal polypi usually start from the ethmoid. Polypi of the naso-pharynx, on the other hand, not uncommonly penetrate the ethmoid cells. When the bridge of the nose seems widened, the orbit is narrowed by the pushing outward of the inner wall of the orbit, and protusion of the eyeball in various directions results.

Fibroma originating in the ethmoid itself has been observed but once (see *Wiener med. Jahrb.*, 1882), and hence it is generally believed that a fibroma involving the ethmoid usually starts from the bones of the nose.

Osteoma of the ethmoid bone usually starts from some neighboring cavity. The first objective symptom is a very hard tumor at the inner canthus of the eye. Then follow swelling of the neighboring part of the cheek, protrusion of the eyeball forward and outward, and diplopia. The inner canthus is pushed forward, as are also the nasal and lachrymal bones. The tumor also usually involves the nasal meatus, pushes the septum nasi to one side, and closes one or both sides of the meatus. It pushes the hard palate downward. The vision may be normal or diminished. There may be choked disc and suppuration of the cornea from an inability to close the lids completely over the eye. If the osteoma of the ethmoid be encapsulated, it may easily be separated from its bony attachments. These osteomata never tend to penetrate the cranial cavity, and in this they differ from bony tumors of the frontal sinus. Their operative removal is not as a rule difficult. If, on the contrary, they arise from the frontal sinus and penetrate the ethmoid, their removal is usually dangerous and gives bad results.

The Sphenoid Bone.—Disease of the body of the sphenoid, whether ending in caries and necrosis or not, may cause not only exophthalmus, but disturbance of vision (see *Klin. Mon. f. Augenheilk.* for August, 1863), on account of the close proximity of the optic canal. Pain occurring in the course of disease of the body of the sphenoid may show itself in a totally different part of the area of influence of the trifacial nerve, and thus lead to a faulty diagnosis. (See *Union méd.*, 1872, and Virchow's *Archiv f. path. Anat. u. Physiol. u. f. klin. Med.*, xvi, 5 and 6).

Polypi in the sphenoid sinus may develop there independently, or they may originate in the naso-pharynx and penetrate thence into the sphenoidal sinus and ethmoid cells. They may also perforate the bone and enter the middle fossa of the skull, and even cause meningitis without giving rise to any disturbance of vision.

Osteomata of the sphenoid may start from the periosteum or the diploe. In many cases they are developed from the em-

bryonic remains of cartilage, and sometimes arise in the cavities themselves. They tend to penetrate the cavity of the skull, and, by compression of the optic nerve in the optic canal, early lead to blindness of both eyes.

Hyperostosis and *exostosis* of the sphenoid may produce the same orbital and ocular symptoms as osteoma of the sphenoidal sinus does.

Enchondroma of the sphenoid is excessively rare, only one case having been reported in literature.

Sarcoma.—In sarcoma of the base of the skull it is generally very difficult to determine the point of origin. Virchow says that they never start primarily from the mucous membranes of cavities, but from the underlying bone; and the mucous membrane is either secondarily affected or pushed forward by the growth. The general symptoms are here loss of sight, hearing, and smell, facial paralysis and neuralgia, vertigo, somnolence, vomiting, loss of memory, hemiparesis, and loss or impairment of speech. Death results from meningitis or encephalitis. There is no record in literature of sarcoma beginning primarily in the ethmoid, but it may extend into it, and thence through the lamina cribrosa into the cranial cavity or through the lateral wall of the ethmoid into the orbit.

Carcinoma.—Only one case is reported where the carcinoma started in the sphenoidal sinus.

Maxillary Antrum.—The most frequent pathological process met with in the maxillary sinus is *empyema* or *hydrops* of the antrum. Pus may collect in the antrum as a consequence of catarrhal inflammation extending from the nose. The patients usually complain of pain in the region of the upper jaw, and if the collection of pus be considerable, it may flow into the nasal meatus and out through the nostril or back into the pharynx when the patient lies on the opposite side. Empyema is not a common affection, because the lining mucous membrane is very thin and poorly supplied with follicles. The most common source of purulent inflammation is from disease of the teeth, especially of the posterior molars, forming either subperiosteal abscess or abscess of the antrum itself. Another

form of disease met with in the antrum is *polypoid cysts*, which may originate here, but are much more likely to arise in the naso-pharynx and involve the antrum secondarily.

Tumors.—Pathological new growths of the superior maxilla differ in their clinical appearances according as they start from the alveolar arch or from the body of the bone. The former are, of course, visible in the mouth. Tumors of the antrum are difficult to recognize if they have not already caused distention of the sinus. The symptoms are pain in the upper teeth, a dull pain in the region of the antrum, discharge of pus and blood from the nose in lying down, and more or less epiphora or overflow of tears. As the tumor grows, the walls of the antrum are gradually absorbed and a new thin scale of bone is developed from the periosteum. This may occur in the anterior wall, or in the orbital wall, or in the alveolar wall, and the tumor soon extends toward the nose and causes great enlargement of the hole communicating with the nasal meatus. These nasal growths extending from the antrum are often erroneously mistaken for nasal polypi. Finally the growth frees itself from its bony envelope and comes to lie immediately under the soft parts. If a swelling appears simultaneously in all the above places, a diagnosis may be made of tumor in the antrum. Protrusion of the anterior wall of the antrum alone might mean a cyst of one of the tooth cavities or a periosteal tumor, as well as a tumor of the antrum. In such cases puncture with a trocar would probably differentiate between an external and an internal tumor. A large tumor of the antrum would probably increase the breadth of the cheek, would push the nose toward the opposite side, and would push the eye upward and outward. If the tumor grows from the bone itself, the inferior orbital margin is decidedly broadened. Tumors of the antrum itself rather tend to break through into the nose, the mouth, or the orbit.

Tumors of the superior maxilla, whether they start from the bone or the antrum, gradually extend into all the neighboring cavities. They early involve the nasal meatus, thence extend into the spheno-maxillary and palatine fossæ and pharynx, and

finally perforate the base of the skull. They usually involve the orbit later, and sometimes extend into it from the ethmoid cells, even before the floor of the orbit is perforated. The treatment of these tumors consists either in extirpation of the growth, in partial resection, or in total resection of the superior maxilla.

Tumors of the Naso-pharynx.—Fibroid tumors of the pterygo-palatine fossa may enter the orbit through the infra-orbital fissure. They cause neuralgia of the infra-orbital or posterior alveolar nerves. The orbital portion of the tumor may divide into two branches, one involving the eyeball and the other extending into the cranial cavity, through the supra-orbital fissure. These tumors eventually extend into all the neighboring cavities.

CONCLUSIONS.

Tumors of the Sphenoid.—So long as a pathological process, whether it be inflammatory or a new growth, is limited to the antrum of the sphenoid, the subjective symptoms are either entirely absent or there may be severe pain in the head. If the process extends to the neighboring structures, symptoms arise which point to the probability that the sphenoid bone is the seat of the disease—such as blindness due to compression of one or both optic nerves, the visible or tangible presence of the growth in the naso-pharynx, ethmoid, orbit, or skull. The entrance of the growth into the cranial cavity may occur without any subjective symptoms, or there may be severe headache. If the progress of the growth is very rapid, meningitis or cerebral abscess will result. The ophthalmoscopic symptoms are either papillitis or atrophy of the optic nerves, due to perineuritis and pressure of the swollen nerve-sheath on the optic nerve-fibers. In some cases the pressure is exerted on the optic nerve in the optic canal. Tumors of the sphenoid antrum may perforate the middle fossa of the skull without causing blindness, and when blindness does occur in these cases, it is not necessarily due to pressure on the optic chiasm, for it may

be unilateral. If an orbital tumor rapidly causes blindness, and the latter starts from the temporal side of the field and leaves the region of the macula lutea unaffected to the last, and if at the same time a growth appears in the naso-pharynx, it is probable that the tumor began in the sphenoid antrum.

Tumors of the Ethmoid.—A morbid growth confined within the ethmoid cells gives rise either to no symptoms at all or merely to headache. Inflammation of the mucous membrane lining the ethmoid cells may extend from the naso-pharynx, the frontal sinus, the maxillary antrum, or the orbit. The ethmoid cells may be turned into a single large cavity by a collection of mucus or pus within it. So long as a tumor is contained within the limits of the ethmoid cells there are either no subjective symptoms or there are paroxysmal headaches, with a feeling of heat and epistaxis. The orbital symptoms are the same as those of tumor of the orbit. The motility of the eyeball is limited. The vision may be only slightly affected, or there may be complete blindness. The visual field may not be affected. If the tumor has entered the naso-pharynx, the mouth is more or less open and the speech is nasal. Later there is loss of the sense of smell. If the ethmoid cells are opened into by the growth, there is more or less continuous dropping of cerebro-spinal fluid from the nose, owing to a communication between the upper wall or roof of the ethmoid cells and fissures at the base of the skull. There may also be orbital or palpebral emphysema, and hemorrhage from the nostril on the same side.

Mucocele, or Abscess of the Frontal Sinus.—In chronic inflammatory disease of the frontal sinus there may or may not be supra-orbital pain. If the process is confined to the frontal sinus, there is no other symptom. If, in addition to the pain, there is sensitiveness on pressure over the frontal boss, swelling along the lower surface of the supraorbital margin and along the inner wall of the orbit, and displacement of the eyeball downward and outward, it is probable that the disease has extended from the frontal sinus to the ethmoid cells. If, in addition to these symptoms, there are coryza, ozæna, and a puru-

lent discharge from the nostril, the nasal meatus has become involved and the diagnosis is certain. But, unless all of these symptoms are present, the diagnosis is very difficult and almost impossible. If the first symptom of orbital complication is the appearance of a dense, hard swelling at the upper and inner angle of the orbit, along the superior orbital margin and region of the lachrymal bone, and if the growth is slow and painless, the disease is almost certainly an *osteoma* of the frontal bone, which will eventually involve the orbital plate of the ethmoid, and later the cavity of the skull.

Tumors of the Maxillary Antrum.—Tumors of the antrum may cause pain in the teeth or in the region of the infra-orbital nerve, but not until they have attained considerable size and have more or less completely filled the antrum, the distention of the walls of the cavity causing the pain by pressure on the nerve-twigs. Subsequently the diagnosis may be rendered easier, either by a projection forward of the anterior bony wall, or by dislocation of the eyeball upward and outward, or even upward and inward, by the protrusion of the floor of the orbit. Usually at this stage of the growth the tumor may also present in the nasal meatus, or pharynx, or both. In no case is it possible to diagnosticate a tumor of the antrum early in its development.

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

FEBRUARY, 1892.

No. 2.

ORIGINAL ARTICLES.

MUCOUS PATCH OF THE CONJUNCTIVA.

BY J. S. BARNES, M.D., MILWAUKEE, WIS.

A barber, of German parentage, referred by Dr. Nolte and seen with Dr. H. V. Würdemann, came complaining of a "small tumor," as he expressed it, on the palpebral conjunctiva of the lower lid of the left eye. Particles of dust, to which he attributed the cause of his trouble, had been a source of irritation to the eye six days previous. A syphilitic history, the initial lesion dating back eighteen months, was acknowledged. "Mixed" treatment was still being continued, the skin was smooth and fair, and he appeared to be in a good physical condition. There was a mucous patch on the right buccal membrane, scars of old ones on the opposite side and on the back of the pharynx. On examining the eye, on the conjunctiva of the left lower lid, a circumscribed spot, not vascular, slightly elevated, and of a peculiar greyish color about four mm. in length and two mm. wide was seen two mm. from the edge of the lid and a little to the outer side of median line.

The parts were thoroughly cleansed with 1-4000 bichloride

solution and lotio nigra painted on. The patient was given same with instructions to apply it himself. At the following visit, two days later, the ulcer had spread to the contiguous surface of the ocular conjunctiva forming somewhat of a triangular patch, the rounded apex extending nearly to the limbus of the cornea with a healthy bridge of conjunctiva be-



FIG. 1.

tween it and the original patch. [See Fig. 1.] The patient was directed to continue with the lotio nigra several times a day. At the expiration of a week scarcely a trace of the patch appeared. An interval of three weeks elapsed before his next appearance, during which the ulcer had entirely healed with the formation of synblepharon between the ocular and palpebral conjunctiva.

ANNUAL REPORT OF THE PRESBYTERIAN
EYE, EAR AND THROAT CHARITY HOS-
PITAL OF BALTIMORE CITY, 1891.

BY JULIAN J. CHISOLM, M.D., SURGEON IN CHIEF.

The hospital work for the year presents sufficient items of interest to warrant comment. The number of cases treated was 10,003, of which 7,364 were eye patients, 1,458 suffered with ear affections and 1,181 were throat patients. There were 1,127 cases among negroes, which fairly represent the proportion of colored to the white population of Baltimore City.

Of the eye cases the first tabulated were lid affections, always numerous, this year numbering 1280. There were 18 cases of *lid cancer* and 181 of *tarsal tumor*, a larger percentage than in preceding years. One item of curious interest was 13 cases of *pediculi of the lashes*. In the preceding 13 years of hospital work only 12 cases in all had been recorded. The marked influx of this rare disease is explained by the admission of numbers of Russian and Polish Jews to the Dispensary. They were recent arrivals in this country and had not dwelled long enough to have their home habits disturbed. The louse from the head, as is well known, is never seen on the eye lashes, nor does the body louse locate itself on these hairs. It is the crab louse of the pubis that is found attached to these cilia. One of these cases of phtheiriasis was in a negro child, and a second case was in a well dressed white native, a boy, æt. 12, and of apparently cleanly habits. The insects were destroyed by rubbing the edges of the lids with yellow oxide of mercury ointment.

Among the affections of eye muscles there were 264 cases of *strabismus*. This hospital has done good work in removing these ugly deformities from the street of Baltimore City. At one time pedestrians would constantly encounter cross eyed people. Now they are not often met with. 1369 cases of squint have been operated upon in this institution.

In the list of conjunctival affections there were 48 cases of *purulent ophthalmia* of the newly born. When infants are brought to the hospital early enough, with the cornea still clear, no eye has ever been lost from this destructive disease. Unfortunately we see too many with corneas already perforated under the home treatment, whatever that may have been. The hospital course of treatment is the daily instillation of a drop of a 1% solution of nitrate of silver, and the persistent use at home of a borax solution (grs. x to 3j), the eyes being kept clean by the hourly use of these drops. The nitrate of silver solution is used as long as the pus secretion continues, viz. once a day at the hospital. This necessitates a daily visit for inspection for from 10 to 20 days. The earlier the caustic solution is used the more prompt the control of the suppurations and a stronger solution of the silver nitrate than 5 grains to the ounce of distilled water is never used, and the one drop never applied more frequently than once in 24 hours.

There were 16 cases of *vernal conjunctivitis*. This very tedious disease yielded promptly to free cauterization of the thickened conjunctival rim, around the corneal border, by means of the galvano-cautery. The same remedy was found efficacious in cases of episcleritis. In some cases the red thick lumps under the conjunctiva, which had resisted all other remedies, disappeared promptly under the free cauterization.

Of *cataract cases* 570 sought treatment at the hospital during the year 1891; 188 of these were operated upon. There were 132 extractions, 88 without iridectomy and 44 with iridectomy. Under the aseptic precaution of plunging all instruments in boiling water, both before and after using them, there has not been a single case of corneal sloughing after cataract operation this year. Cataract extraction has now become the ideal

operation in surgery. In the hands of skillful surgeons good results are nearly always obtained. In all cases of simple senile cataract I omit the section of the iris in the extraction; 6 cases of senile cataract were ripened by needling. They were sufficiently advanced to interfere with useful vision, and yet with no promise of maturing for many months. These were in old persons who had not the time to await the slow processes of nature. In from one to two weeks after opening the capsule all transparant lens substance had become opaque. The lens was then extracted without iridectomy and with excellent results. In one of these cases a persistent diarrhœa from the day after the operation necessitated frequent daily visits of the patient to the water closet, yet $V = \frac{20}{xx}$ was obtained. The tendency is to perform cataract extractions without awaiting the complete maturing of the lens. In extracting senile cataracts I remove the anterior capsule with forceps. It is an improvement over the cystotome. It does away to a great extent the necessity for a second operation for capsular films, and gives more immediate good vision.

Operations on the eyeball show 50 enucleations, 3 eviscerations and 8 optico-ciliary neurotomies. I find much benefit from this last operative procedure in the preservation of comparatively good looking eyes made painless by nerve section. In this hospital 82 neurotomies have been performed. In only 3 cases as far as known to me was it necessary to enucleate because of returning pain in the eyeball. I have had no trouble in the operation, and no bad consequences from it. The eviscerations were in cases of panophthalmitis with much swelling of eyeball and eyelids. Recovery by evisceration is not so prompt as after enucleations. To many surgeons it seems a safer practice to leave the socket tissues undisturbed, when the eyeball is full of pus, and yet in my own experience I have never seen trouble from enucleating eyes during the height of suppuration.

Although chloroform is the general anæsthetic administered at this hospital for all tedious, painful operations the *bromide of ethyl* has been in constant use since 1881 for all

painful operations of short duration. A drachm of this liquid in an air-tight cone held over the mouth and nose of a patient will ensure complete anesthesia in less than one minute. No one can resist its narcotic influence. It has been administered at the hospital thousands of times in the past ten years and always with satisfaction. It is a powerful remedy to be used with caution. With the watchful care that is practiced in its administration it has been found always efficient and always safe. My assistants have become familiar with the mode of administration. I use a thick towel folded in cone form, with a piece of thick paper between one of the layers of towel to keep out the air and to shut in the anæsthetic. The hollow of the cone makes a sufficiently commodious air chamber. The base of the cone, a soft towel, can adopt itself as an air tight joint upon the face. It is necessary to make the atmosphere breathed a saturated ethylized air, then anæsthesia comes after a very few inhalations. If the air be admitted freely from without no narcotism takes place.

A CASE OF DERMOID CYST OF THE ORBIT.

BY JOHN DUNN, M.D., RICHMOND, VA.

Miss A., æt. 16, was brought to me to have removed a small, firm tumor situated at the inner angle of the eye, apparently just above the lachrymal sac. The skin was movable over the tumor, which itself seemed also slightly movable. The father of the young lady said that he had first noticed the swelling when Miss A. was about three years old; that it had remained at one size for many years, but that of late it had begun to increase rather rapidly; that for the past two months whenever Miss A. *had a bad cold the tumor would swell and become almost purple on its surface.* Miss A. said that it had never given her pain, but that its variations in size were marked; that some days it was scarcely noticeable, while others it produced a considerable swelling at the corner of the eye. The ball was healthy, nor was there present any obstruction to the flow of the tears, nor had the patient complained of any. The temporary swellings of the tumor when the patient had a cold made me wrongly suspect that it was in some way connected with the lachrymal sac. I accordingly passed a small knife along the upper canaliculus into the sac and thence into the tumor. About half a teaspoonful of an oleomargarine colored, semi-granular, fatty substance came out. My mistake in diagnosis was then evident. For a week no discharge came from the cyst, either into the nose or externally. About two weeks after the cyst had been opened it began to increase in size and to discharge through the lachrymal sac. As the patient lived in a distant city, directions were given her physician in regard to washing the sac out with an antiseptic fluid. Con-

siderable œdema of the lids followed this treatment, and when I next saw Miss A. an abscess had formed at the seat of the sac, the opening into the lachrymal sac having fortunately, as it turned out, closed. The abscess was opened through an incision in the skin, emptied, and several times washed out with nitrate of silver solution. In a short while the discharge from the sac ceased, the outer wound healed, and I had hopes the sac wall has been sufficiently destroyed to the inflammation to disappear in time.

One year later Miss A. came again to see me. The tumor was growing rapidly she said; it had begun to reappear slowly shortly after I had seen her; it was now beginning to be painful. It was now about the size of a hazel-nut, and filled the whole angle between the nose and frontal bone. The skin over it was so stretched that several small blood vessels could plainly be seen in it. The skin, however, at this point was not adherent to the tumor. Accordingly a 4% cocaine solution was injected over the surface of the tumor, and on making an incision through the skin the tumor was found to have a distinct sac which was not adherent anywhere to the skin externally, so that it could be readily separated from it. With the aid of cocaine I was enabled to dissect out the tumor entirely. Its sac was a tough, fibrous one; at first it was white, but as the dissection went on it became a reddish blue. Posteriorly, and especially inferiorly, the adhesions between the sac and the surrounding tissues were tough and many. Some of these adhesions were probably due to the inflammation set up at the time of its opening. The only objection I found to the use of cocaine in this case was the time it took, since the bleeding, which was a little annoying, washed away the solution before its effects could be obtained. In the dissection the sac became ruptured below at the point of the former puncture. The escape from it was, however, slight. The contents of the tumor were granular and rather whitish than yellow in color. The hole left by the removal of the tumor was washed with a 1-1500 bichloride and then dusted with iodol. The wound was then closed with several sutures, and although the hole

left by the removal of the sac was from 10 to 12 mm. in diameter, no drainage tube was inserted. A piece of adhesive plaster was put over the wound. The parts healed without supuration so that at the end of about three weeks there was only a fine linear scar to mark the place from which the tumor was removed.

Within the past year, so far as I can find out, two cases of dermoid of the orbit have been reported. One by Pooley in the *Ophthalmic Record*, for December, 1891; the other by Vigues in the *Recueil d'Ophthalmologie* for July, 1891. In both cases the first attempt failed to remove the tumor so as to prevent its return. Pooley attempts to remove his through the cul-de-sac. The sac of tumor is ruptured and there is an end of the attempt. As in my case, where, through a mistake in diagnosis, the sac was simply opened, the removal of the tumor seemed for the first few days to have been accomplished by merely puncturing the sac. Then there is a reaccumulation of the sac contents, inflammation with swelling of the lids. Later on a "more radical operation" is undertaken. No cyst walls can be found. Daily washing with hydrogen peroxide until the wound heals from the bottom. Pooley reports this case cured at the end of a month. Possibly the cure was less complete than it seemed at the end of the month. The apparent absence of any definite sac wall is to be commented on. Vigues finds a firm, whitish, smooth sac, without adherence to the surrounding parts. This continues in a pedicle along the nasal wall. He removes all but the pedicles. The tumor returns and necessitates a second operation. In my case the sac wall is firm, even tough, and, though many adhesions exist between it and the surrounding tissues, with care it can be entirely dissected out. The sac is whitish in appearance, but soon becomes reddish-blue showing its large vascular supply. Some of the adhesions were undoubtedly due to the inflammation that followed its puncture; the others probably due to the displacement pressure exerted during the growth of the tumor. The use of cocaine in these cases is to be advised where the patient is old enough to lend his assistance. After

the skin is cut it is well to apply the cocaine directly to the cut surface by means of cotton soaked in it. This cotton may be left in contact with the parts for a little while. In my case the fluctuation in size of the tumor is to be commented upon, and the explanation it seems, must be sought in some temporary obstruction to the escape of the venous supply from the sac, which in them might owe its cause to increase in the contents of the sac causing change in the relative position of the parts of the tumor, producing thus pressure over veins where none existed before, the swelling disappearing as soon as the collateral veins assume the increased demand upon them.

In view of the length of time that the tumor had existed in Pooley's case it is worthy of comment that there was no sac wall of sufficient thickness to be discoverable. It is in the highest degree probable that some changes go on in the contents as well as the size of these cysts, and that certain parts of the cyst contents must be more or less constantly undergoing absorption, and these changes would seem to be inseparable from changes in the condition of the wall of the sac. The history of the dermoid cysts would be interesting, especially as to how far their increase in size is due to growth of the sac, and how far to increase of the sac contents. Vigues, quoting Panas, says that these intra-orbital dermoid cysts, when their contents are serous, are the result of the imprisoning in the orbit of a part of the foetal nasal mucous membrane. When their contents are oily, containing epithelial cells, hairs, etc., they result from an "*invagination ectodermique dans la fente fronto-maxillaire.*" My case was probably of the latter origin. Pooley ends his article with "I believe that the removal of such a tumor in its sac is practically impossible and that the proper operative course is to keep the orbit drained by a tube, and to inject its cavity until healing takes place from the bottom; nor does it seem an easy matter to accomplish this by operating through the conjunctival cul-de-sac." My case teaches an entirely different lesson, viz., that the proper treatment of encysted tumors of the orbit where we have reason to suspect their dermoid nature is to make, preferably under cocaine

anæsthesia, an incision through the skin over the tumor down to the sac which can then be dissected out in its entirety. No drainage tube is necessary, where proper antiseptic precautions have obtained; and it is best to sew the wound made in the skin together. The hole fills with blood which clots and in time disappears leaving the hole filled in. Where no sac wall can be found, Pooley's suggestion may be followed.

SELECTIONS.

OPTIC NEURITIS AS A FORM OF PERIPHERAL NEURITIS.¹

BY ALVIN A. HUBBELL, M.D., BUFFALO, N. Y.,

Professor of Ophthalmology and Otology in the Medical Department of Niagara University.

Peripheral neuritis, both clinically and pathologically, has assumed a recognized position in medicine to-day.

The attention of physicians in the past has frequently been directed to manifold sensory, motor and trophic affections, but until recently the conjectured lesion has been located in the spinal cord or brain, or the disease has been regarded as merely functional. It was in 1866 that Dumenil² first established by autopsy and microscopical examination the existence of extensive disease in the peripheral nerves as the cause of such manifestations, although Graves, of Dublin, had, nearly twenty years before, expressed his belief that the spinal cord or brain was not the seat of such lesions. Ten years after Dumenil made the first demonstration, Eichhorst³ recorded a case in which a post-mortem examination showed the spinal cord to be perfectly sound, but several peripheral nerves presented evidences, both grossly and microscopically, of interstitial inflammation. Then followed Joffroy⁴ in 1879, Leyden⁵

¹Read before the New York Medical Association at its eighth annual meeting.

²Gazette hebdom. de m d. et de chirurg., 1866.

³Virchow's Archiv., lxi, 1876.

⁴Arch. de phys. norm. et path., 1879,

⁵Zeitschr. f. klin. Med., 1880.

in 1880, and Grainger Stewart⁶ in 1881, with similar reports. During the past decade the pathological study of peripheral nerves has been pursued with commendable zeal, and upon inflammation of them or its results are now known to depend many forms of paralysis, especially localized ones, numerous sensory disturbances, and various trophic changes in the skin, bones, muscles and other tissues whose description in detail I must withhold from this paper.

Investigators have also shown that such inflammations and degenerations follow upon certain diseases or certain agencies with a frequency that justifies the regarding of the latter as ætiological factors in the production of the former. Among those which thus act as causes may be mentioned diphtheria, scarlet fever, measles, small pox, typhoid and malarial fevers, la grippe, syphilis, tuberculosis, leprosy, diabetes, rheumatism, locomotor ataxy, beri-beri, etc., and such substances as lead, arsenic, alcohol, bisulphide of carbon, etc. There is also idiopathic peripheral neuritis whose cause is not apparent, which expresses itself in such diseases as herpes zoster, Raynaud's disease, circumscribed sclerodermia (Hutchinson), sciatica, so-called rheumatic paralysis, such as that of the facial, abducens, etc. Again it may occur from traumatism and pressure. The relation which peripheral neuritis is thus shown to hold to other diseases, both as an effect and as a cause, gives it a far-reaching importance to the diagnostician, therapist, and pathologist.

I desire at this time not only to emphasize this importance, but to indicate also that this disease is not confined to the nerves of motion and general sensation, as is generally understood by the profession, but includes inflammations of nerves of special sense as well, having the same known general causes, as well as arising idiopathically or from unknown causes, and the symptoms of which correspond in character and magnitude with the functions involved. I might with propriety consider inflammations of the olfactory and gustatory

⁶Edinburgh Medical Journal, 1881.

nerves, and point out how they may be the sequence of influences not started or found in their end-organs or in the brain, but arising from the same causes as inflammations of other nerves. It is only thus that many affections of smell and taste can be accounted for. So also with the nerve of hearing. Certain forms of deafness, tinnitus and vertigo are undoubtedly induced by typhus and typhoid fevers, measles, scarlet fever, small-pox, mumps and syphilis, through a peripheral neuritis of the auditory nerve. I will, however, limit this part of my discussion to inflammations of the optic nerve.

The pathology and pathological anatomy underlying many forms of visual disturbances are subjects of comparatively recent study. Before the discovery of the ophthalmoscope the fundus of the eye was clinically an impenetrable region. With this instrument the practitioner has been enabled to reach and study it, and by post-mortem examination has verified the diagnosis of such forms of neuritis as express themselves at the intra-ocular extremity of the optic nerve—the optic disc—by swelling, cloudiness, and change of color. But there are some cases which present the subjective symptoms and clinical history of optic neuritis, but the ophthalmoscope does not show the disc-picture formerly believed to be a necessary accompaniment. As early, however, as 1866, von Graefe⁷ of Berlin, whose clear insight and acuteness of observation have never been excelled, suspected that such subjective symptoms were not due to amaurosis (amaurosis was then, as now, a cloak-word for pathological ignorance) or to brain disease, but rather to inflammation of the optic nerve situated behind the ball and showing very little change within the eye, and, therefore, out of sight of the ophthalmoscopist. He described cases in which vision became clouded and within a few hours or days absolute blindness ensued, and yet the ophthalmoscopic signs were almost negative. Both eyes were symmetrically affected, and the blindness was temporary in some and permanent in others. To this form of disease, acute in character, he gave the name retro-bulbar or retro-ocular optic

⁷Arch. f. Ophthalm., xii, 1866, p. 114.

neuritis. The diagnosis of the lesion was afterward verified by post-mortem examinations. Later, Leber,⁸ in 1869, expressed the belief that the symptoms in certain cases of amblyopia with central scotoma, but without any marked changes in the fundus of the eye, were due to a form of chronic inflammation in the orbital portion of the optic nerve. These conjectures were subsequently entertained by other investigators; but it was not till Samelsohn,⁹ of Cologne, in 1880, and Nettleship and Edmunds,¹⁰ of London, in 1881, made the initial post-mortem examinations of cases of central amblyopia that demonstration was actually made of an inflammatory and resulting degenerative process in the course of the optic nerve. In each of these cases there was found "a tract of chronic interstitial inflammation and degeneration extending from the optic foramen, where it was central, to the eyeball, where it occupied the outer part of the optic nerve".¹¹ Similar results were obtained by Vossius,¹² of Königsberg, 1882; Bunge,¹³ of Halle, 1884; Uhthoff,¹⁴ of Berlin, who made seven autopsies, 1884 to 1886; and Sachs,¹⁵ of Innsbruck, 1887.

Thus, it has been conclusively proved that optic neuritis may exist both with and without objective ophthalmoscopic signs and with varying subjective symptoms from mild to aggravated, and in its progress it may be rapid or slow. These symptoms, objective and subjective, I need not detail here. They are clearly before the profession.

⁸Archiv f. Ophthal., xv, 1869, p. 65

⁹Ctrblt. f. d. med. Wissensch., Berlin, xviii, 1880, p. 418; also, Archiv f. Ophthal., xxviii, 1882, p. 1.

¹⁰Trans. of the Cphthal. Soc. of the United Kingdom, i, 1881, p. 124.

¹¹Nettleship. Trans. of the Ophthal. Soc. of the United Kingdom, 1, 1881, p. 128.

¹²Archiv. 1. Ophthal., xxviii, 1882, p. 201

¹³Ueber Gesichtsfeld, etc. (Field of Vision and Course of the Fibers in the Optical Conducting Apparatus), Halle, 1884.

¹⁴Ctrbl. f. prakt. Augenheilk., 1884, p. 43; and Archiv f. Ophthal., xxxii, 1888, p. 95, and xxxiii, 1887, p. 257.

¹⁵Archiv. f. Augenheilk., xviii, 1887, p. 21 (translated in Knapp's Archives of Ophthalmology, 1889, p. 133).

In diagnosis, however, proper exclusions should be made in cases where impairment of vision can not be readily accounted for by the ophthalmoscope or other means of examination. Thus, there are various lesions within the encephalon that affect vision without involving the optic nerve—for example, disease of the occipital lobe of the brain. Quinine produces in sufficient doses such disturbance of the circulation of blood in the optic nerve by vaso-motor irritation as to greatly contract the field and diminish the acuteness of vision, either temporarily or permanently. Experimental research by De Schweinitz,¹⁶ of Philadelphia, made during the present year on animals goes to show that it does not produce neuritis. Atrophy of the optic nerve may undoubtedly take place without a preceding neuritis by some mechanical or vaso-motor arrest or diminution of blood supply to the nerve.

As causes of optic-nerve inflammation there are many that are common to this and other forms of neuritis. Thus, it may be caused by injury, and injury will produce neuritis elsewhere. Contiguous inflammations, such as orbital cellulitis or meningitis, may cause it. So may other nerves become involved in the inflammatory processes of surrounding tissues. Pressure from growths or foreign bodies causes inflammation of both the optic and other nerves.

It is well proved and generally admitted that certain substances and poisons produce an inflammation of certain peripheral nerves (peripheral neuritis), prominent among which are alcohol, lead, arsenic and bisulphide of carbon. These substances, too, produce some form of optic neuritis. To fortify this statement I will cite some authorities. Uhthoff,¹⁷ of Berlin, has clearly shown that alcohol develops axial or chronic retrobulbar optic neuritis. Hutchinson,¹⁸ of London, and Allbutt,¹⁹ of Leeds, are among several who have reported cases

¹⁶Ophthalmic Review, London, x, 1891, p. 49.

¹⁷Archiv. f. Ophthalm., xxxii, 1886, p. 95, and xxxiii, 1887, p. 257.

¹⁸Royal London Oph. Hospital Reports, Part 1, vol. vii, 1871, p. 6.

¹⁹Use of the Ophthalmoscope, London, 1871, p. 265. See, more recently, Oliver, Gulstonian Lectures on Lead Poisoning. Brit. Med. Jour., March 21, 1891, p. 633.

of optic neuritis and subsequent optic-nerve atrophy, as shown by the ophthalmoscope, caused by lead in the system. Among those who have seen optic neuritis in chronic arsenic poisoning are DaCosta,²⁰ of Philadelphia and C. L. Dana,²¹ of New York; Nettleship,²² of London, Fuchs,²³ of Liège, Galezowski,²⁴ of Paris have seen "axial" optic neuritis (central amplyopia) in persons exposed to the fumes of bisulphide of carbon in the manufacture of certain rubber materials.

Diseases which cause peripheral neuritis also cause optic neuritis. Hulke,²⁵ of London, as early as 1868, recorded cases of optic neuritis after diphtheria, and Allbutt²⁶ and others have made similar observations. Wadsworth,²⁷ of Boston, and others have seen optic neuritis after measles. Macnamara,²⁸ of London has reported cases in which optic neuritis developed in rheumatism and intermittent fever. He has also seen this disease in la grippe,²⁹ and so also have Weeks,³⁰ of New York, and others. The history of the recent epidemics of la grippe furnishes many examples of "peripheral palsies." Typhoid and typhus fevers, small pox, scarlet fever, syphilis, tabes, tuberculosis and diabetes stand out more or less prominently in their ætiological relations to peripheral neuritis. Optic neuritis also is found in each of them in corresponding frequency. Lastly, both peripheral and optic neuritis occur alike idiopathically without any assignable cause.

I might multiply illustrations showing the common origin of both so-called peripheral neuritis and optic neuritis in some

²⁰Medical Times, Philadelphia, March, 1881.

²¹Brain, London, ix, 1886, p. 546.

²²Trans. of the Oph. Soc. of the Un. Kingdom, v, 1885, p. 149.

²³Ibid., p. 152.

²⁴Rec. d'ophtal, 1887, p. 30.

²⁵Royal London Ophthal. Hosp. Rep., vi, p. 108. ^a

²⁶Use of the Ophthalmoscope, 1871.

²⁷Trans. of the Am. Ophthal. Soc., 1880, p. 125.

²⁸British Med. Journal, March 8, and May 3, 1890, pp. 540 and 100.

²⁹Ibid., Aug. 1, 1891, p. 251.

³⁰New York Medical Journal, Aug. 8, 1891, p. 143.

of their varieties, but it seems to me that the evidence already adduced is sufficient to place beyond doubt the claim that certain ætiological influences and pathological results are common to both, the symptoms varying only in correspondence to difference of function of the nerve or nerves affected.

We cannot, perhaps, understand why alcohol, bisulphide of carbon, tobacco or diabetes should induce axial or chronic retro-bulbar neuritis, while lead, arsenic, diphtheria, tabes, la grippe, or measles should develop a neuritis more generally interstitial, often acute and showing ophthalmic signs. Neither can we offer satisfactory explanation why lead pre-eminently affects the nerves supplying the extensor muscles of the extremities and the muscles of the intestine, or why tobacco has a special affinity for the nerves going to the heart, or why diphtheria conspicuously leaves its impress upon the cranial motor nerves and some of the spinal. Yet, such facts remain, and the lesson which they teach us to-day is that inflammation may attack all classes of peripheral nerves alike, those of special sense as well as those of general sensation and motion, that the cause is wide-spread and common, and that the principles of treatment are identical.

Peripheral neuritis in its broadest sense, therefore, becomes of intense interest and far-reaching importance to both the general practitioner and specialist.

ORTHOPTIC TRAINING.¹

BY C. M. CULVER, M.D.

In an article which I read before this Society, in February, 1887, it was predicted that, within the next decade thereafter, the efficiency of our armamentarium, with which to combat convergence anomalies, would be more than doubled.² It was prior to that time that orthoptic training assumed its place among our means for use in that class of cases, but it has since come to be understood as standing very high in its class, in efficiency. It is not as often applicable as is Dyerization, which is a similar training of all the ocular muscles which preside over vision of near objects, but is closely akin to that method of treatment. Indeed, Dyerization is a conjunction of orthoptic training with systematic training of the ciliary muscles. It is assigning orthoptic training a high rank, as regards utility, to place it as a part of Dyerization, which Mr. R. Brudenell Carter,³ of St. George's Hospital, London, praises most highly and which Dr. Lippincott declared, at the last session of the American Ophthalmological Society, to be among the foremost of modern discoveries, in ophthalmology. Its great helpfulness to my patients has taught me to esteem it very highly.

The translation of the Greek word is, "straight," or "right," in the sense in which these words are used in speaking of a straight or right line; the muscles, which undergo orthoptic training, have to do with directing the lines of vision of a pair

¹Read before the Albany County Medical Society, January 13, 1892.

²Albany Medical Annals, May, 1887, p. 151.

³Carter. Eyesight, Good and Bad, page 149.

of eyes, hence this sense might seem applicable in this case. But those lines of vision are straight, however directed, and the muscles trained, orthoptically, control only the observance of, or divergence from, parallelism, of those lines. But the prefix, in the word "orthoptic" has the meaning it has in "orthodoxy," that is, "correct." Although it is primarily essential that the practicing ophthalmologist, when dealing with the average case of abnormality of the directing muscles of the eyes, take fully into count the modifying influence of co-existing accommodation, the phrase, "orthoptic training," has been limited, in its application, to the extrinsic muscles of the eyes. Hence, although Dyerization is the systematic training which enables eyes that were formerly, muscularly impotent relatively, to accomplish an average amount of near work, "correctly," the accepted application of orthoptic training, is not directly to any other than the extrinsic, or directing, muscles of the eyes.

Many authors have spoken of gymnastic training of the extrinsic muscles, by means of prisms. It is an essential of binocular vision that the images, for the two eyes of a pair, be formed upon corresponding parts of their retinae. When such images are formed on heterologous parts of the retinae, diplopia results. Hence, as those endowed with binocular vision instinctively avoid diplopia, the extrinsic muscles, whenever that is possible, bring the eyes of a pair into such relative positions that the images of the object fixed are formed upon homologous parts of their retinae. A prism deflects a ray of light, from the course it has pursued, in a direction toward the base of the prism. Accordingly, if a prism be made to deflect the rays from any object so that, for one eye of a pair, they impinge on a part of its retina, which does not correspond to the part upon which the image in the fellow eye is formed, diplopia results. When the extrinsic muscles can so move the eyes as to make the parts of the retinae, upon which the images are formed, correspond, binocular, single vision ensues. It is in this way that prisms are used for the training of the extrinsic muscles, by causing those muscles to act. Dr.

Noyes,⁴ in his work, has called this "gymnastic" training, and commended it. While it has been somewhat discussed with reference to its applicability to the extrinsic muscles which cause vertical movements of the eye-balls, that use of the method does not appear to me of practical utility and, so far as my own experience is concerned, I am not aware of a case in which it has done any good, nor do I recall a case in which I have attempted to make use of it. That it is possible to produce a certain degree of increase in power, of such a muscle, by its systematic exercise, by such means, is conceded, but its practicality is questionable, since, if the degree is slight, a permanent prism may more readily do the same work, and if the degree be great nothing is properly in order but operative procedure. Of course prisms compose, theoretically, by the combination of an infinite number of them, any lens that can be mentioned, and they enter, practically, into ophthalmological practice, as in von Graefe's vertical-diplopia test, in the double prism of the Javal-Schiøtz Ophthalmometer, and in Maddox's double-prism. I value prisms, therapeutically, when worn, much more than I formerly did; having been led, by Dr. Noyes' suggestions, to use them more, in practice, and by the experience in practice, to esteem them more highly. But while I am disposed to hold, generally, the just position held by Dr. Noyes, of neither praising them without stint nor utterly condemning them, I think prisms have been too much relied upon, by ophthalmologists, both as means of diagnosis and as therapeutic agents. Several ophthalmologists have lately, publicly expressed a similar opinion.⁵ I have just cited the forms of them, suggested by von Graefe and Maddox, used as aids to diagnosis, but, even here, Maddox's stirring-rod test, for which the apparatus, necessary, can be bought for the 1-4800th of the price of the von Graefe test that I customarily use, is adequate, in the average case. I use

⁴Noyes. *Diseases of the Eye*, 1890, page 190.

⁵Vide Risley; *A New Apparatus* etc. *The Medical and Surgical Reporter*, fifth December, 1891. Vide Myles Standish, *Amer. Jour. of Oph.*, November, 1891, page 372.

several methods, in such tests, but the stirring-rod is the one on which most dependence is placed. In the training, or exercise of the lateral recti muscles prisms are of more use than elsewhere, especially when it is the recti *externi* that we seek to influence. In all near work, the *interni* of a pair of average eyes are brought into use, in answer to a volition. But the *externi* cannot be voluntarily made to act, hence the use of weak abducting prisms. The normal power of a pair of *recti externi* amounts to that used in overcoming abducting prisms aggregating 3.50 minimum deviation degrees, to do which the eyes recede from each other about one metre-angle. While adducting prisms may be used, for the exercise of the internal *recti*, that is a very primitive method, and one which has sunk into comparative disuse. I recall a case, wherein this method was used, with satisfaction to all parties. But it required daily visits of the patient, at my office for a month. Since that time I have procured, in similar cases, as good results, with much less work for the patient. The average person has nothing to do with prisms, except, as a child, to be amused a few hours with a mutilated one, which formerly helped to adorn a chandelier. Hence, when it is a question of using the internal *recti*, which an average pair of eyes always uses, when near work is being done, it seems like a wild chase round Robin Hood's barn, to resort to prisms, when the binocular fixation of any near object will accomplish the same action of the internal *recti*. Since prisms are so seldom dealt with by the average person, it is true that, in many cases, the amount of power represented by the amount of prism-deflection that a pair of internal *recti* can overcome, is often much less than the power actually at the disposal of these muscles. In such cases the lack is not of force, but of knack. I recall a case, which I saw about eight years ago, in which the patient seemed to have utterly immobile eyes, so far as adduction was concerned. She called on me, daily, four times. The three first days showed no improvement. The third day's call was almost exclusively devoted to attempting to show the patient what was wanted of the eyes. The last time she came, she

announced, on entering the consultation room, that she had been able to make the eyes do what I required of them. And it was true and the defect had entirely disappeared. The patient had not acquired any power, which enabled her to annihilate the defect, but had merely learned the knack of combatting the action of adducting prisms. In another case, the patient appeared to have no adductive power in the morning, that being at a time when I used prisms, mainly for the test of such function. In the afternoon of the same day, I gave the patient prisms aggregating more than half the amount that can be overcome by a normal pair of eyes. Presently he said to me, as I sat several meters distant from him: "I see you single, at times, but not at all distinctly, at those times." Of course, in order to converge to any considerable extent, the concomitant function of accommodation needed to be used, simultaneously, and equally of course, that rendered any object, ten feet distant, blurred to the eyes that were viewing it. Mr. F. had acquired at least fifteen times the ability, to converge, that he had acquired the *knack* of using prisms. In neither of these cases was the seeming lack of converging power, in the beginning, due to a want of intelligence, for the girl seemed bright and Mr. F. is one of the most intelligent men of my acquaintance. Hence we may expect to meet with similar cases of response of the *interni* to the influence of prisms, among those composing the average *clientèle*.

In discussing this matter, Dr. Oliver⁶ has written about adducting prisms: "The ability to overcome prisms equal to fifty degrees implies, in most cases, an ability indefinitely exceeding this and many who, at first trial, can accomplish only one-half of this, will after two or three attempts, on different days, succeed in uniting images with the full strength of the adducting prisms." As a fixation-object, when it is desired to practice the systematic use of the *interni*, Landolt's ophthalmodynamometer is the best we have, it being the nearest practical realization of the luminous line, or point. I have

⁶Ann. of the Universal Medical Sciences, 1889, vol. iv, page 13-14.

used various forms of it, but have last adopted that which is used with an ordinary candle. When last in London, I got a point, from Mr. R. Brudenell Carter, which I have found useful. He suggested to me the putting of the red glass, in a pair designed for use in orthoptic training or as a part of the apparatus employed in Snellen's test, with red and green letters, always on the right side, because the letter "R" is the initial of both red and right. It is only of mnemonic utility, but I have used it to much advantage. In a pair of spectacles, used in orthoptic training of the *interni*, one glass is made red, in order that the image, received by that eye, may be reddened, and, consequently, more readily distinguished, as a separate image, if there be real diplopia. The other ellipse of the frame may be empty, since the object is solely to obtain images with some evident difference between them. For use, in this connection, I devised a black card, bearing a white line, this being in order that the object, which the line constitutes, may be susceptible of coloration, like the luminous line obtained when using Landolt's dynamometer. It is not my purpose to cite case-histories in connection with this paper. It would be possible, however, to cite many cases in which this simple card apparatus has sufficed to obtain satisfactory results, when it has been used in connection with orthoptic training. The longer arm is of such length that when it is free and is placed against the bridge of the average nose, the other arm, bearing the white line, will be eleven millimeters from the person's eyes. Hence, when the free end of the longer arm is against the nose bridge, and the object line, on the shorter arm, at right angles to its lower one, is seen binocularly and single, nine meter-angles of convergence (the minimum-normal) are being performed by the eyes in question. The use of such a fixation-object as a finger, which has been too commonly employed, in tests or training of the internal *recti* muscles, suggests what Dr. Randall said, in a paper before the American Ophthalmological Society, in '89, that "No eye, with a self-respecting accommodation, could focus for such a point." It is desirable too, that the fixation-object be white,

on a black ground, in order that its coloration may be feasible. When the Red-Right hint of Mr. Carter's is used, and a patient resides at a distance, if he writes that the red line is to the left, the surgeon knows at once that the convergence does not suffice. If too much convergence were employed, for the distance of the object, the red line would be at the left.

Landolt's stereoscope is specially serviceable in the training of the lateral *recti* muscles. The ordinary stereoscope lenses are each the combination of a bi-convex lens, of six dioptries, with an adducting prism of six minimum-deviation degrees. Landolt's stereoscope is of the dimensions of the ordinary one, and generally like it, except that there are no prisms used in it, and each of the simple convex lenses, of six dioptries, is movable, horizontally, about forty millimeters. By the possible decentration of the lenses, a great deal of prismatic effect is obtainable, in either sense, hence the potential control of the amount of task imposed upon the eyes concerned. This apparatus has been specially useful to me in cases wherein I have already operated for the correction of strabismus. While I am content with the final results of my squint-operations, I must be permitted to be a skeptic as to anybody's ability to do accurately what an English reviewer has blamed me for calling "dose" these operations. "Landolt insists upon the importance of combining an orthoptic treatment with an operation for strabismus. His views on this question are to be found in a concise form, in the official report made by him to the International Congress for Ophthalmology, at Heidelberg."⁷

Orthoptic training is often the most primary observance of physiology, in connection with the extrinsic, ocular muscles. In many cases, too, it constitutes the ounce of prevention that is worth a ton of cure, in the cases where it is applicable as a preventive.

⁷Ann. of the Univ. Med. Sci., 1889, vol. 4, page B-48; vide Landolt, Rapport, sur la Question du Strabisme, présenté au VIIe Congrès International d'Ophthalmologie à Heidelberg, page 11.

THE ACTION OF TUBERCULIN UPON THE EXPERIMENTAL EYE TUBERCULOSIS OF THE RABBIT.

Report from the Institute for Infectious Diseases in Berlin.

BY PROF. W. DOENITZ.

Contrary to the negative results of Baumgarten, the author said, in his report before the Society of Charité Physicians, that he is now in a position to demonstrate healed tubercular processes accomplished with tuberculin, and which have been heretofore considered as impossible. The author then demonstrated, in the eyes of a number of rabbits, tubercular processes established by inoculation, both with pure cultures and with tubercular tissues, in various stages, from that of the first irritative reaction, occurring about the middle of the third week, to that of the complete cure, the latter resulting in from three to four months, the eye retaining its function as a visual organ.

In the early part of the treatment with tuberculin, the tubercular process is hastened, cloudiness of the cornea and pannus developing rapidly, whereas in the eye of the control animal, the process is slower, with, however, early necrotic processes at the seat of the puncture and rapid perforation, this necrosis not occurring when tuberculin in gradually increasing doses was administered. It is immaterial whether the treatment is begun immediately after inoculation, or at a time when true tubercle had been formed. The administration of the product obtained by Klebs from Koch's tuberculin

was attended with only temporary improvement; the eyes were eventually lost. The same dose of the unmodified tuberculin, and continued without increase, also failed to produce good results.

The conclusions are:

1. The tuberculin is a sure curative agent for the experimental tuberculosis of the eye of the rabbit.

2. The tuberculin shows its curative effect only after true tubercle can be demonstrated.

1. The first effect of the tuberculin is a transient but severe irritation of the eye.

4. Under the continuous action of the tuberculin, all irritation in the eye subsides.

5. When, before beginning of the treatment, deep-reaching destructive processes have not occurred, the cure results in retention of the visual functions of the eye, otherwise, atrophy results.

6. To a cure it is necessary that the tuberculin be given in increasing doses, and the continued maintenance of a not too slight reaction is essential.—*Deutsche Medicinische Wochenschrift*, November 19, 1891.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, DECEMBER 10, 1891.

HENRY POWER, F.R.C.S., President, in the Chair.

ORBITAL HÆMORRHAGES IN YOUNG CHILDREN.

Mr. Holmes Spicer read a paper, describing several cases recently under observation. The patients are generally hand-fed infants from six to eighteen months of age, who have been brought up on "infant foods." The orbital hæmorrhage occurs spontaneously beneath the periosteum, and shows either as a line of blood-staining at the orbital margin, or as a large effusion giving rise to displacement of the eye and distension of the upper lid. Sub-periosteal extravasations also occur in other parts of the body, generally during an attack of infantile scurvy or "scurvy-rickets."

The form which the orbital hæmorrhage assumes is due to the anatomical arrangement of the periosteum and other structures. The hæmorrhage subsides rapidly at first, but does not disappear entirely, and the eye is left prominent for many months. The treatment is essentially that of scurvy; in addition to the ordinary food, juice of fresh meat, a little fruit or vegetable, cod-liver oil or cream should be given. The slighter cases recover rapidly, the more serious ones are slow in progress and often fatal.

IMPLANTATION CYST OF THE CORNEA.

Mr. Treacher Collins showed an eyeball removed from a boy, *æt.* 12, one year and nine months after a perforating wound of the lower part of the cornea by a stick. Situated partly in the cornea and partly in the sclerotic, at the seat of injury was a large cyst measuring 9·5 millimetres laterally and 5 millimetres antero-posteriorly. This was found microscopically to be lined by laminated epithelium, the most flattened cells being towards the interior of the cyst. Since no epithelium exists normally in the parenchyma of the cornea, Mr. Collins thought that this cyst had resulted from the implantation of a portion of the surface epithelium into the substance of the cornea, and that this epithelium had subsequently grown and proliferated, some of the cells undergoing mucoid degeneration, thus forming the fluid contents of the cyst.

HEREDITARY OPTIC ATROPHY.

Mr. Johnson Taylor (Norwich) read notes of four cases of this affection occurring in one family. The history as to heredity was scanty, the maternal grandmother being the only relation whose sight was known to have been defective; she became blind or nearly so when *æt.* 40. The cases described included four male children in a family of eleven, namely, the first, second, fifth, and eighth, the remaining children, five females and two males, being unaffected. In the first case sight failed rapidly but unequally in the two eyes at the age of 27. In the second case failure began at the age of 21, and progressed quickly until vision was reduced to less than 20 J. with the right eye and 18 J. with the left. In the third case the defect was discovered at the age of 18, and at that time one eye alone was defective. In the fourth case sight was found to be bad when the child was only *æt.* 6. For about a year he seems to have been nearly blind, but since then vision has improved, so that with the left eye he can read some words of 1 J.; the right eye sees 20 J. badly. In all the cases there was

marked central amblyopia, with color defect more evident in the central part of the field, and in addition there was some loss of the periphery of the field. The ophthalmoscopic appearances in each case were those of optic nerve atrophy, with slight haziness of the discs and some obscuration of the lamina cribrosa. As is so generally the case, there was a complete absence of symptoms of disease of brain or spinal cord. The three older patients were smokers, but, with the exception of the first, could not be said to smoke excessively. There was no family history of nerve disease.

Dr. Habershon said that he had been much interested in Mr. Taylor's report of his cases. He had some years previously read a paper upon this subject before the Society, in which he had given notes of a number of cases which he had diagnosed as belonging to that form of optic nerve atrophy first described by Leber. He noticed that in Mr. Taylor's cases there was peripheral contraction of the fields of vision in addition to central scotoma. In the original paper Leber laid stress upon the presence of central defects without any contraction of the fields. He had expressed the opinion in his previous communication to the Society that there were probably two or three factors to be considered in the causation of this disease. In many cases it seemed likely that one of these factors was tobacco.

CARD SPECIMENS.

Mr. Juler: (1) Symmetrical Orbital Tumors; (2) Persistent Retinal Hæmorrhages in a Case of Diabetes; (3) Unusual Growth in the Vitreous.—Mr. Johnson Taylor: Intraocular Growth of Doubtful Nature.—Mr. F. R. Cross: (1) Essential Shrinking ("Pemphigus") of the Conjunctiva; (2) Opaque Nerve Fibres Covering the Optic Disc.—Mr. Tatham Thompson: Case of Leber's Hereditary Optic Atrophy.

REVIEW.

A HANDBOOK OF THE DISEASES OF THE EYE AND THEIR TREATMENT. By Henry A. Swanzy, A.M., M.B., F.R.C.S.I. 3rd edition. Philadelphia, P. Blakiston, Son & Co., 1890.

Swanzy's book is one of the best recent text-books on eye diseases. The short time in which a third edition was reached shows plainly its well deserved popularity. Type and illustrations are of the best.

THE REFRACTION OF THE EYE. A manual for students; by Gustavus Hartridge, F.R.C.S., with ninety-eight illustrations and test-types. Fifth edition. Philadelphia, P. Blakiston, Son & Co., 1891.

The fifth edition of this excellent manual, which we have heartily recommended to our confrères at former occasions, is considerably enlarged. We can only repeat the recommendations of former years.

3000 QUESTIONS ON MEDICAL SUBJECTS ARRANGED FOR SELF-EXAMINATION. Philadelphia, P. Blakiston, Son & Co., 1891.

This is a little volume intended to help the student in preparing for correct answers to the examiner. Personally, we are not fond of encouraging parrot-like learning; yet there may be good coming from the little volume, in spite of our opinion.

TEXT-BOOK OF OPHTHALMOSCOPY. By Edward G. Loring, M.D. Edited by Francis B. L. Loring, M.D. Part II. DISEASES OF THE RETINA, OPTIC NERVE AND CHOROID; THEIR VARIETIES AND COMPLICATIONS. New York, D. Appleton & Co., 1891.

Whosoever was in possession of the first and admirable volume of this life work of Dr. E. G. Loring, who was so suddenly called from this existence, awaited anxiously the appearance of this, the second volume. It is a great pity that Dr. E. G. Loring could not have finished this volume, and yet, unfinished as it is, it is full of original work and thought, and, in our opinion, Dr. F. B. Loring deserves praise for having given us his brother's work without any addition. It is certainly an admirable work of an original American worker, and as such should not be wanting in any oculist's library.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. A yearly report of the progress of the general sanitary sciences throughout the world. Edited by Charles E. Sajous, M.D., Vol. II., Philadelphia, F. A. Davis, 1891.

This comprehensive work gives a complete synopsis of a year's progress in medical science, and it is, therefore, of great value as a book of reference. The report on ophthalmology is by Ch. A. Oliver.

ALT.

Every one of these books may be obtained from Messrs. J. H. Chambers & Co., 914 Locust street, St. Louis, Mo.

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

MARCH, 1892.

No. 3.

ORIGINAL ARTICLES.

RETINITIS PIGMENTOSA IN THE COLORED
RACE.

BY S. C. AYRES, M.D., CINCINNATI, OHIO.

R. T., æt. 45, a carpenter by occupation, a strong, well-built mulatto, gave the following history of his case:

He says that for more than twenty years he has had difficulty of seeing at night and in feeble light. This defect of vision has gradually increased until now he cannot walk alone at night, and has difficulty in avoiding articles of furniture when he enters a room in day-light. Out of doors he can see fairly well and can still work at his trade. He is myopic in both eyes and without glasses V—0.1. Right eye M 2.5 D. V—0.5. Left eye M 3 D. V—0.4. His field of vision is concentrically contracted in both eyes. Examined with a perimeter the field of vision in his right eye is vertically 20° , horizontally 26° . In the left eye his field of vision is 20° in both diameters. The fundus of each eye presents the characteristic

retinal pigmentation. The pigment is approaching the O. D. in both eyes from all directions. The optic discs are somewhat blanched and the calibre of the arteries very much narrowed. In all respects it is a typical case of retinal pigmentation. He is the oldest of eight children and the only one similarly affected so far as he knows. His parents were not related and both had good eyes. His mother is still living and enjoys good vision.

This is the only case of this disease I have ever seen in the colored race, and therefore report it, hoping it may call forth statements from other observers who have better opportunities than I have for seeing diseases among these people.

TRANSLATION.

THE VALUE OF ANTIPYRINE IN OPHTHALMOTHERAPEUTICS.¹

BY DR. B. WICHERKIEWICZ, POSEN.

Translated by A. ALT, M.D., St. Louis.

Antipyrine is one of the series of remedies which, thanks to the progress in chemistry, have sprung up in our time like toadstools after a rain, and which have been rightly or wrongly recommended against different diseases. It differs from other remedies by advantages which secure it a permanent place in our armamentarium.

Whatever text-books describe the advantages of this remedy, speak of its antipyretic action, (hence its name), and further call it a nerve remedy. I have, however, never found any mention of its antiseptic power, although Demroth suspects that the apyresis brought about by antipyrine is simply due to its antiparasitic faculties. As a proof of this he states that after the ingestion of antipyrine the temperature is decreasing before the sweating comes on, and consequently this decrease cannot solely be due to the sweating.

C. Engel states that the antibacterial effect of antipyrine is much smaller than that of salicylic acid and quinine. Therefore (? Transl.) the internal exhibition of *antipyrine* has been extensively made use of, whether in order to reduce the tem-

¹Paper read in the medical section of the Society of the Friends of the Sciences at Posen, Nov. 7, 1890, enlarged by more recent experiences.

perature or in order to reduce pain and reflex irritability. Never, however, as far as we know, has the remedy been used *locally as an antiseptic*. Bosse² alone praises its effect on ulcers of the leg which are said to have healed rapidly under the influence of antipyrine powdered on them.

It is not my desire to examine into the value of antipyrine in general surgery, I simply desire to point out its valuable peculiarities in ophthalmic therapeutics, and to draw particular attention to its thus far unknown or too little employed characteristics.

Thus far antipyrine has been almost exclusively used internally or by subcutaneous injection. Leaving aside as too well known, the subcutaneous injections, as recommended by Germain Sée, against neuralgia of the trigeminus, I wish to relate a few less well-known cases and especially the following case of Rampoldi:³

A patient who had been blind for three years from total occlusion of the pupil and secondary glaucoma had extreme pains. He did not consent to an iridectomy, till sympathetic ophthalmia attacked the fellow eye. Although this did not relieve him, he did not allow the eye to be removed.

Having tried various remedies in vain Rampoldi gave the antipyrine three grammes daily. After the first two grammes the pain and the symptoms of sympathetic ophthalmia began to get less and in a short time a complete cure was accomplished.

Panas⁴ recommends antipyrine internally in diabetes with cataract. It diminishes the secretion of sugar in a daily minimal dose of three grammes, in spite of a mixed diet, and checks the development of the cataract.

Kacaurov⁵ used antipyrine in twenty-nine cases, especially

²Antipyrin ein Reforderungsmittel der Granulationsbildung bei atonischen Unterschenkelgeschwüren. Berlin. klin. Wochenschr., 1886, p. 33.

³Caso grave d'oftalmodinia guarito con l'antipyrine. Annali d'ottalmologia, 1889, p. 58.

⁴Archives d'ophtalmologie, May and June, 1889, p. 265.

⁵Wracz, No. 7, 1886.

in neuralgia following different eye affections, after cataract extraction, in inflammations of the cornea, glaucoma, etc.

Grand-Clement of Lyon, before the French Ophthalmological Society, in 1888, related a case of one sided hemeralopia which he cured with four subcutaneous injections of antipyrine made in the temporal region. It was by accident, as is so often the case, that a remedy given for a certain purpose, was found useful in a totally unexpected direction. The case was the following:

The hemeralopia was due to a very insignificant retinitis caused by a traumatic hepatitis, which was brought about by a fall from a horse four years previously and which had been cured for three years. Having employed uselessly different remedies against the hemeralopia Grand-Clement gave antipyrine to get rid of a very disagreeable blepharospasmus, and was greatly astonished when the patient felt the hemeralopia improved after the first injection, and was perfectly cured in nine days by four injections, even before the blepharospasmus had totally disappeared.

In another communication made to the Academy of Medicine of Paris, the same author recommends antipyrine injections against blepharospasmus.⁶

We see from the foregoing that antipyrine has been recommended internally as well as by subcutaneous injection in different affections. It was also tried as a hæmostatic. Chibret⁷ recommends subcutaneous injections of antipyrine with cocaine before making an enucleation, in order to prevent serious hæmorrhage.

Hénoque and Huchard also consider antipyrine a hæmostatic. Although I have not been able to understand the necessity for such injections, since hæmorrhage after enucleations have never appeared to be serious, the employment of antipyrine in the detailed manner may be of use in special

⁶Union Médicale, 1888, No. 60, p. 739.

⁷Emploi de l'antipyrine dans l'énucleation du globe oculaire. Recueil d'ophtalmologie, 1889, No. 1, p. 27.

cases, as for instance, in evisceration of the orbit in which a clear view which is of especial importance is often obstructed by hæmorrhage; furthermore, in cases of optico-ciliary neurotomy, since the hæmorrhage after this operation is very apt to produce exophthalmus.

Chibret injects one gramme of antipyrine, two centigrammes of cocaine, and two grammes of water.

I have often had occasion in my clinic to confirm the effects of antipyrine just spoken of.

I have given it internally or by subcutaneous injection almost exclusively in cases of intense pain after superficial injuries to the cornea, furthermore, in iridocyclitis, in blepharospasmus and in neuralgias of the trigeminus, which, two years ago, were so frequently seen as sequel to influenza. I may here state that such injections must not be made close to a large nerve-branch, since they cause a long continued pain and often even a swelling which lasts for weeks and disfigures the patient. This is especially the case if the solution is too strong (for instance, 100%, as Germain Sée recommends).

In my opinion, based on a large experience, solutions of from 25% to 50% are sufficient.

In view of the well-known antipyretic, antiseptic and anti-neuralgic effect of this remedy, I thought it possible to make use of these peculiarities in oculo-therapeutics by applying it immediately to the diseased tissue. By clinical observation of a whole series of cases I became convinced that we really have in antipyrine a remedy which may be used successfully in this manner and which in some instances is very much superior to other well known remedies.

I employ solutions of from 1 to 20%, either pure or with a small quantity of the bichloride of mercury. With strong solutions of the bichloride of mercury, antipyrine forms a white precipitate; with solutions of boracic acid, the precipitate is so much thicker that they cannot be employed at all. Sulphate of copper causes a greenish precipitate.

My experience is now based on from 500 to 600 cases. The results may be summed up as follows:

Antipyrine has no astringent quality; it is, however, a very good antiseptic remedy in acute as well as in chronic inflammations of the conjunctiva, which are caused by an infection and begin with considerable discharge. This discharge disappears in a short time under the application of antipyrine, but the inflammatory condition remains unchanged unless other remedies are at the same time employed against it.

In granular conjunctivitis and especially in the process of softening of the granulations, antipyrine used in a 25% solution two or three times a day, after the granules have been squeezed out, diminishes the profuse discharge, and alters the conjunctiva in such a manner that it is more easily influenced by other remedies. Aside from the diminution of the discharge the swelling of the conjunctiva decreases slowly and this membrane assumes its normal appearance.

I have further on seen that pannus of the cornea clears up rapidly or disappears altogether. The effect of antipyrine is less favorable in cases of acute granular conjunctivitis and nitrate of silver is here decidedly to be preferred. In the beginning antipyrine may be used as an antiseptic, but as soon as swelling, injection and discharge do not show any diminution it is necessary to use astringents alone, or in conjunction with it.

In quite a number of instances I have found that certain forms of conjunctivitis which had remained totally indifferent to old and approved remedies, could be influenced in the most favorable manner by our remedy. This was especially so with the conjunctivitis following influenza, which in my experience, could often not bear any other remedy.

It almost seems that antipyrine has an especial influence on the micro-organisms of influenza.

My ideas in this direction must, of course, be verified by experiments, when the characteristic influenza microbe will have been isolated.

I may mention that antipyrine acted especially well in that rare form of conjunctival disease, the papillary trachoma, which is often overlooked since it produces no very pronounced lesion.

In making a superficial examination of such eyes we often find nothing; with a magnifying glass, however, we see the real conditions. There is injection and more or less swelling of the papillary body. These changes annoy the patient and cause itching, pressure, continued pain, and especially an inability to do near work for any length of time on account of a feeling of dryness and sleepiness.

This conjunctival affection is doubtlessly a form of granular conjunctivitis which it precedes or follows, according to my experience. It is, however, quite often seen as a separate form of disease. Its epidemic or endemic appearance shows the infectious nature. This disease uncommonly resists the usual remedies and the patients are generally treated for months and even years with various remedies which only increase their discomfort. I do not doubt, moreover, that the complex of symptoms called *asthenopia nervosa* is very often produced by this affection of the conjunctiva.

In this disease a weak solution of antipyrine (from 3 to 5 %, where there is catarrhal discharge combined with a $\frac{1}{3}$ to $\frac{1}{2}$ % solution of sulphate of zinc) has proven to be an excellent remedy. It must be instilled from one to three times a day.

I have found that antipyrine is also very valuable in chronic blennorrhœa of the lachrymal sac. In three cases treated without any improvement by means of alum, zinc, sublimate, nitrate of silver, etc., injections of antipyrine brought about a speedy cure.

Later on I injected a 25 % solution once or twice a day, having cleaned the sac first by injecting a solution of boracic acid, and have found it perfectly satisfactory. Of course, the primary affection must be treated also.

In phlyctænular conjunctivitis or strumous keratitis antipyrine is ineffectual. Anyhow, we have a number of better rem-

edies. In blepharitis marginalis and in internal eye affections antipyrine used externally gave no appreciable results.

In episcleritis and scleritis antipyrine sometimes not only allays the very disagreeable pain, but acts very favorably upon the swelling and exerts some influence upon the accompanying dimness of the cornea. In these cases I have made use of an ointment containing 10% of antipyrine.

Last year I saw an extremely favorable action of instillations of antipyrine (5 to 10%) in a case of vernal conjunctivitis. Other remedies were however used at the same time, but they never had such a good effect when used alone.

Antipyrine has shown itself useful also in glaucoma.

In a man, 60 years of age, who had an iridectomy performed secundum artem but unsuccessfully on an eye suffering from hæmorrhagic glaucoma, I succeeded in removing the extreme tension and severe pain (other means having failed) by instilling twice daily a few drops of a 25% solution in the respective side of the nose while the head was tilted backward. (This case will be reported elsewhere in full). I have since seen a good effect in a number of cases of glaucoma treated in the same manner.

I have not used antipyrine in any other forms of eye diseases.

As stated above, I have used antipyrine almost exclusively in solutions. These must be instilled into the eye when fresh or after having been sterilized by boiling. Even a 2% solution causes a burning sensation, which is increased with the strength of the solution, and may become very painful. This disagreeable sensation, however, lasts but a short time, to give place to a rather agreeable feeling. For a short time the visual acuity seems to be increased, as I found in my own case. My visual acuity (M. O, 5) of $\frac{6}{V}$ always increased to $\frac{6}{IV}$ after the instillation of a 5% solution. Pupil and accommodation are in no way influenced, neither the normal sensitiveness of conjunctiva or cornea. Yet it seems to diminish pathological hyperæsthesia. Strong solutions (50%) cause a severe con-

tinuous pain, probably by destruction of the epithelium and irritation of the nerve ends.

The remedy may also be used in ointments (5 to 100%); I can, however, not especially praise this mode of employment, and the patients do not seem to like it. In cases of trachoma I have also used the remedy as a powder mixed with sugar or boracic acid, but found it wanting.

How can we explain the favorable action of the remedy when locally applied?

First, it removes the cause of the disease by killing certain microbes; second, by contracting the blood-vessels it reduces the hyperæmia and gives the tissues their natural elasticity; third, by the intense burning sensation the instillation causes a sudden reflex spasm of the lids, which gradually disappears and thus acts beneficially upon the condition of the conjunctiva, subconjunctival tissue and cornea, in the way of massage; fourth, it reduces the increased sensibility and somewhat alleviates pain.

From the foregoing remarks it is seen, that antipyrine is a valuable remedy in the treatment of eye diseases.

It is not probable that it will cause toxic symptoms when used externally in the form of instillations, ointment or powder; whether it may not under certain conditions cause continued local irritation or have even a deleterious local effect, my experience does not warrant me to say.

While thus recommending to my colleagues this remedy for further experimentation in the detailed directions I want to warn them beforehand, that it may not always act beneficially in the diseases mentioned. We must never forget that the physician's first duty is to individualize his cases when prescribing.

Like other remedies, antipyrine may, in two seemingly parallel cases, act beneficially in one and disastrously in the other.

If there is a small number, only, of affections in which the action of this remedy is superior to that of others, we will, by introducing it, increase our therapeutic possibilities.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, JANUARY 28, 1892.

HENRY POWER, F.R.C.S., President, in the Chair.

CASE OF TUBERCULOSIS OF THE IRIS, SUSPENSORY LIGAMENT, AND RETINA.

This paper by Mr. R. L. Knaggs (Leeds) was read by the Secretary. A boy, æt. 9 months, suffered from iritis of a quiet type, with fourteen to twenty white nodules in the iris. Those in the lower part of the anterior chamber coalesced, forming a large yellowish mass which protruded at the sclero-corneal margin. The eye was excised, but the child died seven weeks later from tubercular meningitis. Sections of the eye showed that the iris had been transformed into a tuberculous mass, in which were many well-marked tubercles. The inflammatory growth had thinned and bulged the outer tunic of the eye, had penetrated the uveal pigment layer at a point just in front of the ciliary body, had passed through the suspensory ligament, and had been stopped abruptly at the hyaloid membrane. The canal Petit was filled with inflammatory exudation, and contained sederal tubercles in which giant cells were well marked. The suspensory ligament did not seem to have undergone any alteration, although embedded in tuberculous tissue. In the lens were spaces filled with inflammatory cells, and in the retina there was an inflammatory focus situated between the

nerve fibre layer and the pigment layer, the latter being quite unaffected. The was recorded not only as a contribution to the literature of tubercular iritis but because of the bearing it had upon questions connected with the suspensory ligament. Drawings of the pathological conditions were exhibited.

THE ETIOLOGY, PROGNOSIS AND TREATMENT OF DISSEMINATED DOT CATARACT.

MR. C. WRAY (Croydon) read this paper, in which, after noting that the literature of the subject was very scanty, he said that in its commonest form this affection was characterized by very numerous punctiform opacities, generally less than 0.5 mm. in diameter, symmetrically arranged in the crystalline lenses. The dots were generally most plentiful toward the equator, and in some instances were confined to that region, the central part of the lens being quite free. Sometimes there were also streaks of opacity, arranged without reference to the anatomical structure of the lens; occasionally the dots were so minute, and situated so peripherally, as to be overlooked unless carefully searched for.

The following varieties of dot cataract had been noticed:

1. The simple form as above described, occurring in young subjects, with no other changes suggestive of lens degeneration.
2. The simple form complicated by the presence of opaque streaks arranged without reference to the anatomy of the lens.
3. Vacuoles present in addition to the dots and streaks.
4. The above conditions with degenerative changes suggesting ordinary advancing cataract.

The affection was most easily recognized in childhood; in later life it might be mistaken for developing senile cataract. There was nothing in the history of the condition of the patients to account for the lens changes; the simplest view was that they were merely transmitted structural peculiarities, like the white dots found on the finger nails. This explana-

tion seemed the more probable, since in each case in which the condition was found in children, it was present in the mother. In regard to prognosis, two points were noteworthy; the non-deterioration of vision in those parents who were affected, and the presence of the dots unchanged in one patient who had advanced nuclear (senile) cataract. In only one instance had the question of treatment to be seriously discussed, and in this, the vision with correcting glasses being equal to the patient's requirements, no active interference was advised. If in any case the sight were not sufficient for the requirements of the individual, the rules applicable in the treatment of lamellar cataract would apply. Nine cases were recorded, in nearly all of which the refraction was ametropic. In six cases in which the children were discovered to have disseminated dot cataract, the same condition was found in the mother. In no instance in which it was present in the child was it absent in the parent. In two cases it was present in a parent, once the father, once the mother, but absent in the offspring.

MR. SYDNEY STEPHENSON said he had seen a number of cases like those described by Mr. Wray, and in several he had noted congenital defects of the eyes, for example, opaque nerve fibres, persistent pupillary membrane, etc. He asked if Mr. Wray had found such defects in any of his cases.

MR. LANG said that, in his experience, the lens was easily extracted in cases of dotted cataract with nearly clear cortex, and he had consequently no hesitation in advising operation.

MR. LAWFORD thought the vacuoles in the lenses, alluded to by Mr. Wray, were not uncommon in cases in which no other evidence of lenticular change was forthcoming. He had observed some cases for three or four years, and had been unable to detect any increase in the size or number of the vacuoles. He asked whether their presence had any significance.

DR. DOYNE was unable to agree with Mr. Lang as to the ease with which these dotted cataracts could be extracted.

He had found considerable difficulty in removing the cortical portion of the lens.

MR GUNN inquired if the dots of opacity were very numerous, and Mr. Juler asked if the condition was generally non-progressive.

MR. WRAY, in reply, said that the dots in the lens were generally present in large numbers. He thought that the opacities in most cases remained nearly stationary. He had seen one case in which there was a persistent hyaloid artery.

CARD SPECIMENS.

MR. CRITCHETT: Case of Conical Cornea Treated by Galvano-Cautery Without Perforation.

MR. GUNN: Apparatus for Illuminating the Eyeballs From Behind.

MR. JULER: Microscopic Demonstration of Hyaloid Growth from the Lamina Vitrea of the Choroid.

MR. HIGGINS: Tuberculosis of Iris.

MR. ERNST CLARKE: Case of Unusual Retinal Detachment (?) Neoplasm.

NEWS.

THE PAN-AMERICAN MEDICAL CONGRESS.

The Committee on Permanent Organization met at St. Louis, October 14, 15 and 16, 1891, and adopted a series of General Regulations for the permanent organization of the Pan-American Medical Congress, and a series of special Regulations for the government of the first meeting, and recommended that the Incorporators adopt both series of regulations as the organic law of the Congress.

Pursuant to such Regulations the following general officers were elected, viz.:

President.—William Pepper, M.D., LL.D., Philadelphia, Pa.

Treasurer.—Abraham M. Owen, A.M., M.D., Evansville, Ind.

Secretary General —Charles A. L. Reed, M.D., Cincinnati, Ohio.

INTERNATIONAL EXECUTIVE COMMITTEE.

Argentina, Dr. Pedro Lagleyze; Bolivia, Emilio de Tomassi; Brazil, Dr. Carlos Costa; British North America, Dr. James F. W. Ross; British West Indies, Dr. Jas. A. De Wolf; Ceili, Dr. Moises Amaral; Columbia, P. N. Ibanez; Costa Rica, Dr. D. Nunez; Ecuador, Dr. Ricardo-Cucalon; Guatemala, Dr. José Monteris; Haiti, Dr. D. Lamothe; Hawaii, ; Spanish Honduras, Dr. George Bernhard; Mexico, Dr. Thomas Noriégá; Nicaragua, Dr. Juan I. Urtecho; Paraguay, ; Peru, Dr. José Cassamira Ulloa; Salvador, Dr. David J. Guzman; Santo Domingo, ; Spanish West Indies, Dr. Juan Santos Fernandez; United States, Dr. A. Vander Veer;

Uruguay, Dr. Jacinto De Leon; Venezuela, Dr. Elias Roderiguez; Danish, Dutch, and French West Indies,

The Auxiliary Committee nominated by the various members of the Committee on Permanent Organization each for his own State, and already commissioned by the Chairman, was confirmed.

The election of officers of sections was begun, but time would not permit of the completion of the list which was referred to a special committee with power to act. It has been inexpedient to publish the list until it is completed, which can hardly be accomplished before the meeting of the Committee on Permanent Organization at Detroit in June; but the organization of particular sections will be announced through the medical press as rapidly as officers are elected by the special committee.

In accordance with the wish of the Committee on Permanent Organization as expressed in Special Regulation No. 4, Drs. I. N. Love, A. B. Richardson, L. S. McMurtry, R. B. Hall, E. V. Fitzpatrick and Charles A. L. Reed met in Cincinnati and signed the legal form of application for Articles of Incorporation of the Pan-American Medical Congress, which Articles of Incorporation were duly issued by the Secretary of the State of Ohio, under date of March 15, A.D., 1892.

At a meeting of the Incorporators held March 16, 1892, the following Regulations, general and special, recommended by the Committee on Permanent Organization were formally adopted as the organic law of the Pan-American Medical Congress in accordance with the Laws of Ohio, and all elections had by the Committee on Permanent Organization, in accordance with such regulations were confirmed and made a part of the laws of the Congress:

GENERAL REGULATIONS.

TITLE.

1. This organization shall be known as "The Pan-American Medical Congress," and shall meet once in — years.

MEMBERSHIP.

2. Members of the Congress shall consist of such members of the medical profession of the Western Hemisphere, including the West Indies and Hawaii, as shall comply with the special regulations regarding registration, or who shall render service to the Congress in the capacity of Foreign Officers.

OFFICERS.

3. The Executive Officers of the Congress shall be residents of the country in which the Congress shall be held, and shall consist of one President, such Vice-Presidents as may be determined by special regulations, one Treasurer, one Secretary-General, and one Presiding Officer and necessary Secretaries for each section, all of whom shall be elected by the Committee on Organization, and there shall be such Foreign Vice-Presidents, Secretaries, Auxiliary Committees as are hereinafter designated.

THE COMMITTEE ON ORGANIZATION.

4. The Committee on Organization shall be appointed by the representative medical association of the country in which the Congress shall meet. This Committee shall select all domestic officers of the Congress, and shall at its discretion confirm all nominations by members of the International Executive Committee and in the event that any member of the International Executive Committee shall fail to nominate by the time specified by special regulation, the Committee on Organization shall elect officers for the country thus delinquent. It may appoint Vice-Presidents and Auxiliary Committeemen in foreign countries independently of nominations by the members of the International Executive Committee. It shall appoint Auxiliary Committees, arrange for the meeting, and frame special regulations for the session of Congress for which it was appointed. It shall make a report of its transactions to the opening session of the Congress.

THE INTERNATIONAL EXECUTIVE COMMITTEE.

5. There shall be an International Executive Committee which shall be appointed by the first Committee on Organization and which shall consist of one member for each constituent country. This Committee shall hold permanent tenure of office except that when a member shall fail to be present at a meeting of the Congress, his office shall be declared vacant and the vacancy be filled by election held by the registered members from the country from which he was accredited. In the event of no representation whatever from the country in question, the members of the International Executive Committee present, shall determine what disposition shall be made of the office.

It shall be the duty of each member of the International Executive Committee to nominate from the medical profession of his country, one Vice-President for the Congress and one Secretary for each Section of the Congress, and to forward the same to the Chairman of the Committee on Organization; except that in any country in which the Congress shall meet, it shall be the duty of the member of the International Executive Committee for that Country to request his representative national medical association to appoint a Committee on Organization, which Committee on Organization shall discharge the duties designated in Regulation IV. Members of the International Executive Committee shall also nominate such Auxiliary Committees, and shall furnish such information as the Committee on Organization may request.

6. The Committee on Organization may at its discretion cause the Congress to be incorporated, which incorporation shall hold only until the final disbursement of funds for the session held in that particular country. In the event of such incorporation such officers shall be elected and in such manner as may be required by law.

7. The following shall be considered as the constituent countries of the Pan-American Medical Congress:

Argentine Republic, Bolivia, Brazil, British North America, British West Indies, (including B. Honduras), Chili, Honduras, (Sp.), Mexico, Nicaragua, Paraguay, Peru, Salvador, Columbia, Costa Rica, Ecuador, Guatemala, Haiti, Hawaiian Islands, Santo Domingo, Spanish West Indies, United States, Uruguay, Venezuela, Danish, Dutch and French West Indies.

8. The Sections of the Congress shall be as follows:

(1) General Medicine, (2) General Surgery, (3) Military Medicine and Surgery, (4) Obstetrics, (5) Gynæcology and Abdominal Surgery, (6) Therapeutics, (7) Anatomy, (8) Physiology, (9) Diseases of Children, (10) Pathology, (11) Ophthalmology, (12) Laryngology and Rhinology, (13) Otology, (14) Dermatology and Syphilography, (15) General Hygiene and Demography, (16) Marine Hygiene and Quarantine, (17) Orthopædics, (18) Diseases of the Mind and Nervous System, (19) Oral and Dental Surgery, (20) Medical Pedagogics, (21) Medical Jurisdiction.

LANGUAGES.

9. The languages of the Congress shall be Spanish, French, Portuguese and English.

AUXILLARY COMMITTEES.

10. The Auxiliary Committee shall consist of one member for each medical society on one for each considerable centre of population in population in each of the constituent counties of the Congress. Nominations for the Foreign Auxiliary Committee shall be made to the Chairman of the Committee on Organization by the members of the International Executive Committee, each for his own county, except that in the country in which the Congress is to be held nominations shall be made by the Committee on Organization. Appointments on the Auxiliary Committee shall hold only for the meeting for which they were made.

Members of the Auxiliary Committee shall be the official

representatives of the Congress in their respective localities. It shall also be their duty:

(1) To transmit to the profession of their respective districts all information relative to the Congress forwarded to them for that purpose by the General Officers.

(2) To co-operate with the Officers of Sections in securing desirable contributions to the proceedings of the Congress.

(3) To furnish to the General Officers such information as they may request for the purpose of promoting the interests of the Congress.

(4) To cause such publicity to be given to the development of the organization as will elicit the interest of the profession and secure attendance upon the meeting, and they shall discharge such other duties as will promote the welfare of the Congress.

SPECIAL REGULATION OF THE FIRST MEETING.

TIME AND PLACE OF MEETING.

1. The First Pan-American Medical Congress shall be held in the City of Washington, D. C., September 5, 6, 7, 8, A. D., 1893.

REGISTRATION.

2. The Registration fee shall be \$10.00 for members residing in the United States, but no fee shall be charged to foreign members. Each registered member shall receive a card of membership and be furnished a set of the transactions.

ABSTRACTS, PAPERS AND DISCUSSIONS.

3. Contributions are required to forward abstracts of their papers, not to exceed six hundred words each, to be in the hands of the Secretary-General not later than July 10, 1893. These abstracts shall be translated into English, French,

Spanish and Portugese, and shall be published in advance of the meeting for the convenience of the Congress, and no paper shall be placed upon the programme which has not been thus presented by abstract. Papers and discussions will be printed in the language in which they may be presented. All papers read in the Sections shall be surrendered to the Secretaries of the Sections; all addresses read in the General Session shall be surrendered to the Secretary-General as soon as read; and all discussions shall be at once reduced to writing by the participants.

INCORPORATION.

4. The Chairman of the Committee on Organization shall cause the Congress to be incorporated under the laws of Ohio, and fifteen trustees shall be elected in accordance therewith, who by by-laws and through the Executive Committee shall supervise all receipts and disbursements by the Treasurer in accordance with the laws of Ohio. The President, Secretary-General, Treasurer, the member of the International Executive Committee for the United States, and Chairman of Sections shall be *ex-officio* members of the Board of Trustees.

FOREIGN NOMINATIONS.

5. All nominations by the International Executive Committee must be in the hands of the Chairman of the Committee on Organization by June 1, 1892, and in default thereof the Committee on Organization shall elect officers for Countries thus delinquent.

THE ORGANIZATION OF SECTIONS.

6. The officers of each section shall consist of: Honorary Chairman, who shall be residents of the constituent countries of the Congress; one Executive Chairman, who shall organize the work of the Section, direct its deliberations, and deliver

an inaugural address at its opening session; one English-speaking Secretary and one Spanish-speaking Secretary, residents of the United States, who shall co-operate with the Executive Chairman in conducting the correspondence of the section; and there shall be one secretary for each section, resident in each additional constituent country of the Congress.

DOMESTIC AUXILIARY COMMITTEE.

7. The Auxiliary Committee for the United States shall be elected by the Committee on Organization and shall consist of one member for each local medical society, or, in the absence of medical organization, then one in each considerable center of population, which Auxiliary Committee shall co-operate with the Committee on Organization and with the General Officers in promoting the welfare of the Congress. Nominations for the Auxiliary Committee shall be made by the members of the Committee on Organization, each for his own State, except that in the failure of any member to make such nomination by January 1, 1892, or in the inadequacy of the same, the Chairman of the Committee on Organization shall supply the deficiency.

EXECUTIVE COMMITTEE.

8. The Board of Trustees shall designate seven members, including the President, Treasurer, Secretary-General, and member of the International Executive Committee for the United States, who shall comprise an Executive Committee which shall transact all business of the Congress *ad interim* in accordance with By-Laws by the Board of Trustees.

AMENDMENTS.

9. Amendments to these Regulations can be made only by the International Executive Committee on a majority vote, ten members constituting a quorum, at any meeting of the Congress.

Pursuant to the Laws of Ohio and the Regulations adopted as above, and in accordance with nominations by the Committee on Permanent Organization, the Incorporators elected fifteen Trustees as follows:

Dr. W. T. Briggs, Tennessee; Dr. Geo. F. Shrady, New York; Dr. P. O. Hooper, Arkansas; Dr. S. S. Adams, District of Columbia; Dr. H. O. Marcy, Massachusetts; Dr. J. F. Kennedy, Iowa; Dr. H. D. Dalton, Vermont; Dr. L. S. McMurtry, Kentucky; Dr. N. S. Davis, Illinois; Dr. Levi Cooper Lane, California; Dr. I. N. Love, Missouri; Dr. Hunter McGuire, Virginia; Dr. J. C. Culbertson, Illinois; Dr. A. Walter Suiter, New York; Dr. C. H. Mastin, Alabama.

Drs. L. S. McMurtry (Kentucky), I. N. Love (Missouri), and W. W. Potter (New York), were designated to act as members of the Executive Committee.

The organization of the Congress is complete in British North America, the British West Indies, the Spanish West Indies, Guatemala, Nicaragua, United States of Columbia, Brazil, Uruguay, Venezuela and the Argentine Republic. It is confidently expected that the nominations from the remaining countries will be in by June.

It is expected to announce the completed organization of the Congress, its Section and Auxiliary Committees, Domestic and Foreign, by July 1, 1892.

On behalf of the Committee on Permanent Organization,	
J. W. CARHART,	CHARLES A. L. REED,
Secretary.	Chairman.

SELECTIONS.

EYE STRAIN AND DISEASE.

Under the heading of A Great Medical Discovery Ignored, the *Medical News* for December 12, says:

There are few medical truths that have been discovered fraught with more possible and incalculable good to humanity than one that is ignored by the great body of the medical profession.

There are explanations and sufficient reasons for this anomalous fact. Among them may be noted these:

1. The discovery has come about slowly and silently. It has been made by no one man and has come with no flourish of international congressional trampeters. So softly and slowly has it crept into scientific medicine that its own advocates are but half aware of it, and do not yet realize its almost unparalleled value.

2. It is a therapeutic measure that depends for its exercise upon an exactness of knowledge of delicate mysterious physiological and psychological functions that few possess, and upon a subtle discrimination and judgment with which, by character or education, few are endowed.

3. It has the misfortune to depend for its promulgation and practical application upon the specialist, and almost upon the specialist of a specialty—and this in a profession and in an epoch in which it is fashionable to sneer at specialism, and at the specialist who dares plead for the truth he knows—and that, at first at least, only he can know.

4. The tradition and habit and ambition of the ophthalmic

specialist is to treat diseases—inflammations—or to perform operations upon the eye. The truth is that refraction-work has come into tremendous importance, and must make up nine-tenths of the routine practice of the future ophthalmologist.

Is it an exaggeration to say that the chief complaints of fully one-half of the patients that apply to the family physician are of headache and digestional affections? Is it another exaggeration to say that fully one-half fail to get permanent relief?

Is it again an exaggeration to say that from these causes a large proportion of women have hopelessly resigned themselves to a lifetime of wretchedness?

The oculist daily has patients who have spent (to them) fortunes paying physicians and druggists; who have taken everything and done everything for ten, twenty, or thirty years to get relief from wretchedness beyond description. No physician ever said "eyes" to them. Yet a pair of glasses relieving the compound hyperopic, perhaps unsymmetrical, astigmatism and anisometropia give relief as if by magic.

If these things are true to anything like the extent contended for, the general standard of health is being distinctly lowered and the average vitality of the race lessened by a cause that so generally and so profoundly affects its mothers for evil. Headache—deranged function of the organ that controls vital function—and digestional abnormality—nutrition being the very source of vital power—have an evil significance impossible of over-valuation.

For twenty years the ophthalmologists have been tirelessly preaching that eye-strain due to refraction errors is the chief causational factor in the production of headache. This is the truth, and yet the truth is ignored the world over. In Europe it is hardly suspected, commonly scouted, and, so far as therapeutic application is concerned, hardly dreamed of. It is only in the United States, and even here only in one or two cities, that the truth has a comparatively adequate application. To the great majority of those of the country who are suffering

from ametropically-caused disease no word has come as to the origin of their trouble.

But this, as regards headache alone, is only half of the truth. Wherever there is headache there is nutritional disturbance. In rare cases there may be a digestional reflex neurosis without headache and due to ocular irritation. Usually the headache precedes or accompanies. Hence it is that the full power of eye-strain to work disaster will never be realized until there is a general recognition on the part of the profession that anorexia, dyspepsia, and constipation are very, very frequently due directly to eye-strain. It is perfectly useless to sneer at hobby-riding. The sneer will not alter the fact or relieve the patient. It were better and more scientific to test the theory with a mind free of prejudice. One little proof is ready to hand: let the sneerer put on a pair of spectacles such as every oculist applies every day to correct ametropia. At most, it will take but a few hours for the artificial ametropia thus produced to bring on headache, and not only anorexia, but probably vomiting. There is one other test, easily applied: paralyze the accommodation for a week or two in a young patient suffering from possible reflex ocular neuroses. The frequent relief will be a striking lesson in differential diagnostication.

Sick headache, from which thousands in every community are sufferers, is usually, if not always, due to eye-strain, and, unless of lifelong duration, is quickly curable by a pair of proper spectacles.

Anæmia is, perhaps, most frequently due to the ocular irritation of uncorrected ametropia, followed by nutritional disturbance. Many cases of hysteria have the same ætiology.

But possibly the worst result of eye-strain is the generally impaired nutrition, the "nervousness," the neurasthenia, the reduced vitality that so far lessens resisting power as to make the system incapable of withstanding infectious disease or exceptional strain of any type. Eye-strain is a common and great soul-exhauster for the inrooting of a prolific crop of the weeds of general disease.

The "nervous" origin of disease is a fact becoming more recognized every day. If diabetes and albuminuria, as contended, may be of nervous origin, then diabetes, etc., may possibly be due to ametropia. Functional heart trouble, temporary anæsthesia, and paralyses, localized pain, etc., may be caused by a deranged reflex from a morbid peripheral stimulus, such as that of the eye. Functional disease is the forerunner almost always of organic disease—the two are stages or phases of the same fact. Desire and physiological habit produce organs. Unhygienic habit and abnormal function wreck organs.

"But we cure headache, sick headache, giddiness, anæmia, and abnormalism of digestion by drugs alone, and every day." Willingly granted! because these affections are often, and perhaps generally, due to other than ocular causes. And more than this, powerful tonics may sometimes relieve, even when the neurosis is of ocular origin. It is an undeniable fact that some cures may be effected without touching the final and veritable causes of the disease. In stopping the one result of a reflex ocular neurosis by powerful drug action, the reflex may be shunted elsewhere, or more probably the evil effect of forcing ametropic eyes to continue their work without correcting lenses will be to produce the local ocular evils of blunted retinal sensibility (amblyopia), ametropic chorioido-retinitis, imbalance of the muscles (heterophoria), conjunctivitis, cataract, etc.

The cause of so much eye-trouble in modern life? A perfectly evident one: The eye in the animal world and in the human organism up to the present century was developed in response to definite need—that of the clearest possible distant vision. Civilization, demanding close and continued near vision, with the printing and writing and schools and commercialism, its indoor and urban life—all this is a thing of the past few dozen years. An organ produced by millions of years of reaction and habit can not, without harm and injury, be forced in a hundred to a different usage. The tremendous importance of the eye to the organism makes Nature, with her subtle,

wonderful wisdom, turn the irritational eye-strain reflex to brain or nutritive system—anywhere but to the all-important eye!—and hence it is that the eye does not feel pain, but other organs do. Inhibited reflexes produce general hyperæsthesia, vertigo, and headache; switched reflexes produce neuralgia, anorexia, car-sickness, etc.

There is one other manner in which civilization may act upon the eye; the intense labor to which it puts the eye brings ocular irritation and congestion, with varying tension, that undoubtedly produce or help to produce corneal asymmetry or astigmatism, the great agent of eye-strain. The necessity for accurate vision, the slavish continuance of long ocular labor, spurs the over-sensitive ciliary muscle and nerve-centers to extraordinary exertion and, each aiding other, the vicious cycle is complete. The hyperæsthetic sensibilities, the headaches, night-terrors, and anorexia of pain, early-forced, book-fed school children are the inevitable product of far-sighted astigmatism and short-sighted ambition. The brain is forced to unwonted tasks with imperfect ocular means. A discriminating physiologist sees that the eye is an organ fearfully overworked, bound up most intimately with every mental and physical act, most indescribably delicate in adjustment and function, and responding to a stimulus millions of times more swift and more infinitesimally small than that of any other sense mechanism of the body.

Psychologically, character and calling in life have doubtless often been changed and determined by ocular irritation. It is a truism that the disposition is entirely changed by it. The mind is almost the sole product of the function of vision, all thinking being in pictures, the very letters of the alphabet being conventionalized pictures. American morbid restlessness and hyperæsthesia may to some extent be due to ocular irritation.

The practical lesson of it all is (so subtle are these beginnings and causes of evil) that every child, well or not well, should have its eyes examined to see if possible or unsuspected abnormality of the refraction exists. Especially is the possibility

of an ocular origin to be suspected in all cases of malassimilation not clearly traceable to other causes, in all cases of headache, neuralgia, chorea, nightmare, insomnia, etc.

With this Proviso and Condition:—That the ophthalmologist has been thoroughly trained in the very modern science and art of refraction, that a mydriatic be used, and that the refractive error be patiently and accurately worked out, not with the ophthalmoscope, but with the test-lenses, and worked out to a quarter or even to an eighth of a dioptre, and that a painstaking optician fit and adjust accurately made lenses. It is also necessary that spectacles be readjusted monthly so that they shall be kept with mathematical precision in their proper position before the eye.

AN ANOMALOUS ACTION OF THE SULPHATE OF HYOSCYAMINE USED AS A MYDRIATIC.

BY G. E. DE SCHWEINITZ, M.D.,

Professor of Ophthalmology in the Philadelphia Polyclinic; Ophthalmic Surgeon to
Philadelphia Hospital.

The following cases are reported because they illustrate a somewhat unusual result after the instillation of a mydriatic, in each of the cases the sulphate of hyoscyamine.

CASE I.—A man, æt. 24, in good general health, suffered from ciliary pain and occasional violent headaches, migrainal in type, associated with gastric disturbances and renal torpidity. Many of the headaches appeared to be due to over-use of the eyes. The eye-grounds were normal, with the exception of slight retinal haze veiling the margins of the disks, and some undue fulness of the central veins.

Sulphate of hyoscyamine, one-quarter of a grain to the drachm, was ordered for the purpose of correcting the error of refraction, which appeared to be a simple hypermetropic astigmatism. Two instillations were used,—one about the middle of the day, and one some time in the afternoon. Within an hour after the last instillation the patient experienced a paroxysm of violent pain, which he described in these words: "I feel as if some one had a gimlet and was boring a hole in my optic nerve." The pinched features, the contracted brow, the clinched hands, and restless demeanor gave every evidence of his intense suffering. The pupils were widely dilated; there was no change in the eye-ground and *no increase of tension*. Unfortunately, no measurements were made of the

degree of the ciliary paralysis. Eserine was instilled, and, although it did not neutralize the action of the mydriatic, the pain gradually subsided. Some time afterward the patient's refractive error was corrected after cumulative instillations of homatropine. Not the slightest inconvenience resulted, and there was no return of pain.

Not a little at a loss to explain this occurrence, the details of the case were repeated to Dr. S. D. Risley, whose investigations of hyoscyamine and its use as a mydriatic I felt might throw some light upon the subject. He at once recalled a similar case in his own experience, where, an hour or two after the instillation of the same drug in the same proportion, precisely the same symptoms arose. When Dr. Risley visited the case, he reasoned that it was possible that the drug had failed not only to paralyze the ciliary muscle completely, but that this structure had been provoked into a state of tonic spasm; hence if complete paralysis were quickly secured, the symptoms would be relieved. Acting on this idea, he repeatedly instilled into the eyes of the patient drops from the same solution which had provoked the pain, and was gratified to find that his theory had led him to the correct treatment. Relief followed very quickly, and there was no return of the trouble.

CASE II.—A man, *æt.* 29, in good general health, and with no bad habits, except the excessive use of tobacco, presented himself on account of stubborn occipital headache and post-ocular pain, aggravated by the use of his eyes. The ophthalmoscope revealed on the right side a large round disk, a deep physiological cup, and a slightly wooly eye-ground, with some absorption of the retinal pigment epithelium. The refractive error was a simple hypermetropic astigmatism. In the left eye the disk was gray, coarse retinal striation being evident from the upper and lower margins, and the choroid was granular. The refractive error apparently was a mixed astigmatism. Hyoscyamine, one-quarter of a grain to the drachm, was prescribed. The next morning the patient appeared with every

evidence of having passed a most uncomfortable night, and stated, curiously enough, almost in the exact words of the former patient, that he felt a pain which he should suppose was like that which would be produced by some one boring a hole in the back of his eye. The conjunctivæ were slightly hyperæmic, the veins of the forehead distended, and the face a little flushed. The intense pain which had existed through the entire night was becoming unendurable.

In spite of his pain, the patient was seated before the test-types, and selected the following glass: O.D.—1.25c. axis $15^{\circ}/_{VI}$; O.S.—2.75c. axis $75^{\circ}/_{XII}$. In other words, he accepted that glass which, judging from the ophthalmoscopic determination of the refractive error, indicated spasm of accommodation. Remembering the suggestion of Dr. Risley, I used an atropine-solution (four grains to the ounce), because I did not happen to have a hyoscyamine-solution at hand. In fifteen minutes after the instillation the pain was gone; in half an hour the uncomfortable flush of the eye had died out, and the man was relieved. He was again seated before the test-types, and now readily selected the following: O.D.+1c. axis $100^{\circ}/_{VI}$; O.S.+1C—2.75c. axis $80^{\circ}/_{VI}$. The ophthalmometer confirmed the degree of astigmatism and the axis of the cylinder, and, after several days' use of the mydriatic, during which the irritable condition of the eye-ground materially improved. This glass was ordered, and has since been worn with comfort.

Further comment on these cases seems unnecessary. It is evident that in all of the cases a cramp of the ciliary muscle took place and occasioned the intense pain of which the patients complained. As soon as full ciliary paralysis was secured the cramp was relieved.—*Therapeutic Gazette*.

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

APRIL, 1892.

No. 4.

ORIGINAL ARTICLES.

THE DISLOCATION OF AN OPAQUE LENS.—
NATURE'S RARE METHOD OF SUDDENLY
AND PAINLESSLY RESTORING SIGHT
TO A CATARACTOUS EYE.

BY JULIAN J. CHISOLM, M.D., BALTIMORE, MD.

In my personal experience, covering thirty years of surgical practice, at least 6,000 cataract patients have consulted me. Among these, two cases have come under my professional care, in which sight was quietly and suddenly restored to patients blind for years with senile cataract. They are of sufficient rarity and interest to have a permanent place in ophthalmic literature.

In the year 1884, I operated upon a lady, æt. 50, and restored perfect vision to an eye blind eight years with cataract. She was extremely frail, not weighing over eighty pounds, and was nervous to a degree. She was surrounded by every luxury, and was, notwithstanding, very miserable. She was very anxious to have sight restored, but was too timid to undergo an operation to regain it. She had been blind and helpless for four years, when, sitting alone one day in her

chamber, with eyes closed according to habit, she suddenly opened them on the approach of some one entering her room. She saw first her hands in her lap, and then could see the approaching figure. In her fright she thought it a vision, and for some time could not believe her senses. In her case the recovery was brought about by no bodily shock. The sight, so suddenly and unexpectedly regained, permitted her to enjoy once more active life. As she was a woman of large wealth she became the wonder of the city. Her miraculous restoration was for a time the absorbing topic of society discussion. The regained privilege in this case was not permanent. After a few months of happiness, darkness slowly resumed its way and she became again blind. I had examined the eyes when the cataracts were forming, and also when they had matured. She had made several appointments to have one of them operated upon, but her courage always failed her when the day for operation approached. When sight came back to her so wonderfully she was congratulated by her friends for her procrastination. Upon examination of the restored eye I found that the opaque lens had fallen into the vitreous chamber and was now out of the line of vision. In the course of a few months the optic nerve took on atrophy and all light slowly and painless-ly vanished from the eye. With the other she still had good light perception. After four more years of blindness, and after much persuasion, she was finally induced to have the cataract removed from the other eye under the influence of chloroform. The result was perfect restoration to sight, with the ability of reading the finest print with ease. This sight she still enjoys.

The second case was in a gentlemen, æt. 45. He had lost the right eye when a child from injury, stuck with a fork. When I first saw him in 1888 he had recently become dull of vision in the left eye also. He had been struck in this eye by a small twig, and the sight had been slowly deteriorating for the past twelve months. Upon examination the lost eye was found everted. The pupil was closed, and adherent to a calcareous lens. In it there was no light perception. With the

left eye he could count fingers at four feet. In this eye there was a well developed senile cataract, a free pupil, with a tremulous iris. As the eyeball moved from side to side I detected a slight motion in the lens, indicating a weakened, suspensory ligament. With the ophthalmoscopic mirror a reddish reflex from the choroid could still be seen. I saw him again in March, 1890. During the interval the opacity of the lens had been complete and only light perception in this eye remained. He came to Baltimore to make inquiry concerning the operation of extraction. It was not convenient for him to have it done at this visit, but he promised to return in the fall for operation. November, 1890, he came to the city for examination, and especially to seek an explanation for the miraculous recovery of his sight. When he went to bed on the night of the November 5, he was as blind as he had been for many previous months. When he opened his eyes on the morning of November 6, he could see all the objects in his chamber. The wonderful transition from blindness to restored sight had come on during his sleep. An ophthalmoscopic examination showed what had occurred. At the most dependant portion of the vitreous chamber the opaque lens was seen. It had tumbled away from the pupil during the night by the giving way of the suspensory ligament, and no longer interfered with vision. With a +14D lens he had $V = \frac{15}{LXXX}$, and by use of an +18D lens he could read the finest print with ease. He had a clear black pupil. I saw this patient again in November, 1890, one year after the miraculous recovery. He still continued in the full enjoyment of excellent vision.

NEWS.

SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

The next annual meeting of this Section will be held in Detroit, Mich., June 7, 8, 9 and 10. The Cadillac Hotel has been selected as headquarters. For the purpose of becoming better acquainted, and cultivating a feeling of good-fellowship among the members of this Section, they will dine together Wednesday, June 8, at 6 P. M., at the Cadillac Hotel. The price of the tickets will be two dollars each, and can be obtained from any member of the Executive Committee. All those expecting to be present will kindly notify the Committee.

The Section will hold two working sessions daily. The first will open at 9 A. M. and close at 11 A. M. The second will open at 3 P. M. and close at 6 P. M.

Titles of papers for the next meeting should be sent at once to the Chairman of the Section, Dr. J. L. Thompson, of Indianapolis, Ind., or to Dr. George F. de Schweinitz, 1401 Locust Street, Philadelphia, Pa.

The Committee published the transactions of the last meeting in a handsome volume, the contents of which reflected much credit on the work done at Washington, D. C. We expect the Section will considerably increase its membership this year, and that the quality of its work will be, as it should be, of the very best.

S. C. AYRES, Cincinnati, Ohio.,

F. C. HOTZ, Chicago, Ill.,

EDWARD JACKSON, Philadelphia, Pa.,

Executive Committee, Section on Ophthalmology, A. M. A.

SELECTIONS.

KERATITIS BULLOSA.¹

BY J. ELLIOTT COLBURN, M.D., CHICAGO.

This exceedingly rare disease of the cornea I have met but twice in a private and dispensary practice extending over a period of more than ten years. Researches made for literature upon the subject yield scanty returns, as many other specialists appear to have been even less favored, and some of the articles are quite vague, and rather evince the idea that the writer has not personally come in contact with the disease

Mr. O—— had been suffering for seven months from a recurring sensation of irritation in the lower lid, as he supposed, of the right eye. At night, it was only after firm pressure and much rubbing, that he was able to keep the lids closed, and frequently was not able to sleep on account of the irritation. Upon examination I found a small vesicle on the cornea, near its margin, which, on being punctured, discharged a minute quantity of clear fluid. These invasions were always attended by flushing of the head and face, considerable general disturbance and ocular neuralgia. At this time the patient was given a solution of zinc. sulph., grains 2, aquæ ounce 1. Eight days later the vesicle had again filled, and the irritation had returned. I again opened the sac, thoroughly removing the pellicle, and made an application of a 4% solution of argentum nit.; it did not recur. I was unable to determine any disease or abnormality of the eye, or any cause for the growth.

¹Read before the Chicago Pathological Society, Feb. 8, 1892.

years, in delicate general health, atheromatous arteries, secretions scant, evidence of much physical suffering. She gave the following history: Twelve years before noticed that vision in right eye was below normal, and that it gradually became less, until there was only perception of light. About one year ago the eye became painful, tender and irritable, followed by the sensation of a foreign body under the upper lid. The eye felt full and protruding, the patient was unable to sleep, restless, and feverish. This condition was quickly followed by lowered sensation of the cornea, and sometimes a gush of tears would seem to give relief, and recovery quickly follow. These attacks occurred with great frequency. This condition not being benefited by the remedies exhibited, the case was referred to me nearly a year after the first invasion, when I found the following.

Left eye normal, but slightly flushed; right eye, conjunctiva much congested, lids closing spasmodically, excessive lachrymation, tension above normal, pupil slightly dilated, lens opaque and shrunken, iris tremulous. Towards the lower margin of the cornea, and extending upwards, there appeared a small elevation—clear as the cornea, but making itself seem by a small point of light reflected from its apex. This elevation was found to be somewhat triangular in shape, with the apex near the centre of the cornea, and filled with a fluid which fluctuated by the pressure of the lids. The sac was punctured, and a small quantity of clear fluid flowed out. The tumor disappeared, and a solution of boracic acid was given, with cocaine to relieve the pain. The patient was directed to return as soon as the sac had refilled, which occurred on the fifth day. The pellicle was carefully removed, and the whole area cauterized by a careful application of carbolic acid. Eserine was also given to lower the tension, and the cocaine to relieve the pain. On the seventh day the sac had again to be removed, and the exposed surface to be cauterized, this time with argentic nitr., 20 grains to the ounce. I then tried galvanocautery, actual-cautery, etc., but without any permanent results. The left eye was becoming more irritated, and tender;

My second case occurred during the past fall. Mrs. S—, photophobia, excessive lachrymation and cloudiness of the cornea after the attack had subsided in the cornea persisting after the attack had subsided in the right eye, led me to fear that the irritation in the right eye was threatening to excite sympathetic disease in the left. I then advised enucleation, and, upon consultation, Dr. Holmes concurred with me in this matter. Dr. Patton administered the ether, and assisted by Dr. Stannard, I enucleated the eye. By repeatedly instilling cocaine prior to the operation, we were enabled to remove the eye with but slight etherization. The wound healed by first intention. The left eye, which had been very irritable and painful, became normal, and the vision improved.

CASES OF PEMPHIGUS CORNEÆ.

These cases so closely resemble in physical appearance the preceding, that I have given three out of eight cases which have come under my observation:

CASE 1.—C. S—, æt. 11, complained of blurring vision in right eye; no pain except at night or when he attempted to close the lids. Upon examination a small vesicle was found over the center of the cornea, about one line in diameter. In attempting to rupture it by pressure upon the lid it was extended three times its former diameter. As I saw this case before the days of cocaine, I applied a pressure bandage and directed the patient to return on the second day, when I found no trace of vesicle, and no opacity. It did not recur.

CASE 2.—Mrs. A—, æt. 31, teacher, was injured in the right eye by a paper wad. Had experienced no irritation except for ten or fifteen minutes immediately following the injury. I saw her upon the fourth day after the injury, and found a small vesicle just below the center of the cornea. There was no corneal injection, or other symptoms of irritation. I advised the use of pressure bandage at night, and upon her return on the following day, I found no trace of the previous trouble.

CASE 3.—Mr. T——, of Kansas, æt. 42, a few days before leaving home noticed a slight irritation in one eye following a ride in drifting sand; had been free from annoyance after the night following the ride until four days later, when he found he could not see well, and experienced a sensation of a foreign body in the lower lid. Upon examination I found a small vesicle near the limbus of the cornea; applied cocaine, and punctured. The following day I could find no trace of the trouble.

A careful examination of the meagre literature upon this subject, both in the text-books and reports of cases, would seem to indicate that there are two forms of vesicles—one which can be, with perfect propriety, classed as a keratitis bullosa—accompanied by inflammatory symptoms; the other a simple pemphigus, free from any manifestation of irritation other than that incident to the friction of the lids over the vesicle.

Keratitis bullosa, or inflammatory vesicle, occurs in eyes suffering from lowered nutrition, most frequently inter-curring with glaucoma, chronic iritis, irido-cyclitis, or chronic non-suppurative pan-ophthalmitis. The first symptoms are pericorneal flushing, photophobia, sharp pain followed, in a few hours, by the sensation of a foreign body in the eye, which is aggravated by every movement of the lids and attempts to close the eye. Accompanying these symptoms there may be supra-orbital pain, and tenderness over the frontal region, and great general disturbance. After a few hours, the tension of the globe becomes markedly increased, the pain lessens and the cornea becomes more or less insensible to the movement of the lids or to the touch. The rupture of the capsule occurs spontaneously from the pressure of the lids and the rubbing of the fingers. In the interval which now occurs between the formation of the second bulla, there is a return of sensation, slight photophobia, lower tension—even to much below normal, the margin of the bulla is outlined by a slight elevation fringed by the ragged and shrunken walls of the ruptured vesicle. When the vesicle is preparing to return promptly, before there

has been complete repair extending over the area covered by the bulla, it will be frequently observed that the center gives an opalescent reflection. This occurs before there has been sufficient time to cover the space with normal epithelium, or obliterate the ragged edges of the vesicle.

According to Schmidt Rimpler, the contents of the vesicle may at times be tinted with blood, but from my observation this takes place in very chronic cases where there has been much vascularity of the cornea in the region of the vesicle, and I am not sure that the tinting with blood is not due to the rupture of vessels in the pellicle.

Arlt says that "The walls of the vesicle do not consist, as was formerly believed, of Bowman's membrane and the epithelial layer, nor of the latter alone, but of a new layer of tissue inserted between the two, and of proliferating cells." This condition would seem to explain the apparently firm boundary of the vesicle, and the impossibility of dissecting up the cornea, by pressure and manipulation. Each new vesicle is an independent structure, for there is scarcely time in the interval, for the renewal of the epithelial layer already destroyed.

Pemphigus Corneæ.—A non-inflammatory vesicle of the cornea, seldom multiple, nor occurring during any eruption or neuralgic disturbance of the head or face.

This form of vesicle is more frequent than the inflammatory, and may occur at any age, and may or may not be coincident with other ocular diseases. The vesicles occur centrally more frequently than at the periphery of the cornea, and frequently fill with great rapidity. There is no pain or irritation, unless the vesicle is pressed upon by the lid, and no pericorneal flushing. The base of the vesicle is oval or round, and pressure upon it, made by traction with the finger upon the lid, will extend the vesicle in the direction of the pressure, even to the dissecting of the cornea to its border.

The capsule once ruptured, never refills, but a grayish opacity covers its base, which rapidly disappears by the replacement of the epithelial layer. There remains no opacity,

or change of curvature of the cornea. In some cases the vesicles do not rupture, but become more and more attenuated, untill they finally disappear.

The causes of the formation of these bullæ are not always clear, but in my experience they have been the results of slight, non-penetrating injuries to the cornea, resulting in a separation of the epithelial layer. A close examination of the contents have never revealed any encysted foreign particle.

The treatment of keratitis bullosa, aside from enucleation or abscision, has not met with brilliant results. Hasner reports a case of cure following a superficial excision of the portion of the cornea involved. Mittendorf suggests quinine, and anti-malarial remedies, but casually remarks that these have never cured.

Iridectomy and paracentesis corneæ have been tried without benefit. In my case we tried cautery with carbolic acid, 75 %, argentum nit., 4 %; galvano- and thermo-cautery, and curetting, without permanently good results.

In view of the reports of cured cases, even though the differential diagnosis may not have been carefully made, it would seem advisable to try any or all of the means of cure suggested, especially if the vision of the fellow eye is below normal, and is liable to further degeneration. If the patients are weak and debilitated from disease or age, it would seem best to state the case fairly, and allow them to determine whether they will submit to further attempts to cure with the possibility of failure, or at once submit to enucleation. The possible influence of the constantly recurring irritation of the effected eye on its fellow, must not be overlooked, and vigilant which kept for any symptom pointing to sympathetic disease. Cocaine and eserine may be used for local relief. In the treatment of simple vesicle or pemphigus corneæ I have had good results from ordinary pressure bandages, but lately have used cocaine, and punctured the sac with a fine point. I have found no other treatment required in the eight cases, three of which I append in my report.

DISCUSSION.

Dr. J. M. Patton.—Mr. President, I had the opportunity of examining the eye, and I saw the operation in this case, and the appearance of the vesicle resembled so much that of the pemphigus from what I have seen, that it seems to me it would be very difficult for a person to make a differential diagnosis, and that we might readily get into difficulty by waiting too long trying to do something with that form before the general practitioner would recognize the fact that he had anything else but a pemphigus vesicle to deal with. The case which I saw was probably a well marked one, and the operation was skillfully and quickly done by Dr. Colburn—necessarily so, because the lady was quite old and feeble; she had organic disease of the heart muscle and valves, and it was a question as to whether she would be able to take an anæsthetic. Certainly it would not be safe to have given her chloroform, and probably not safe to have given ether to full anæsthesia. The case illustrated the fact that such operations may be nicely done by a moderate amount of anæsthesia combined with the use of cocaine locally. She took a small quantity of ether to the first stage of etherization; it did not reach the disturbing period at all. She felt no pain, and the operation was done without any trouble whatever. It could not have been done so quickly and efficiently with either of the anæsthetics alone, or by the single use of cocaine.

I would like to ask Dr. Colburn if there are any distinguishing features to differentiate these two forms that he would lay special stress on?

Dr. Colburn.—I endeavored to point out the two forms of the disease in the differential diagnosis. In the simple vesicle or pemphigus we have no inflammatory symptoms, excepting those incident to the irritation of the lid in moving over the vesicle. In keratitis bullosa we have the inflammatory symptoms preceding and following the formation of the vesicle. And then, furthermore, in keratitis bullosa the vesicle occurs almost invariably in eyes that have been previously diseased,

and in those in which there has been marked interference with the nutrition. In the case which I first mentioned, it would be almost problematical whether the condition related to keratitis bullosa or pemphigus corneæ were it not that it had persisted for so long a time; from the fact that there had been a constant irritation for a period preceding the formation of the vesicle, during its development, and after it had emptied, it would point to its being what we know as a keratitis bullosa. Then there is the period of anæsthesia that occurs for a short time after the vesicle is thoroughly filled, and very frequently in these cases, so far as I can find from the literature of the subject, there is increased tension of the eye. In pemphigus corneæ I have not seen a single case of recurrence of the disease. Another point of difference is that in simple vesicle you can by pressure through the lid extend the vesicle in any direction. In keratitis bullosa you cannot so extend it; it is perfectly rigid. The vesicle will rupture after firm pressure, but will not extend beyond its primary limits. In this case, I think that the constant attempts to remove the vesicle increased the irritable condition of the eye and tended to produce sympathetic irritation in the other eye. Whether there was any sympathetic inflammation excited in the other eye, I do not know. That could only be told by following the case for some time.

Dr. Patton.—You would lay stress on the history or absence of continued irritation in the eye, would you not?

Dr. Colburn.—Yes. If I were convinced that the patient had a recurrent vesicle, and that this was but one of many, I should call it keratitis bullosa, if the case had the other symptoms of inflammatory invasion.

Dr. Geo. H. Cleveland.—I would like to ask Dr. Colburn what connection there is between these troubles and a simple ulcer of the cornea? Or whether a simple ulcer of the cornea may result from these affections? In a simple inflammation, involving corneal layers with destruction of the layers, would perforation occur if the case continued? Furthermore, what is the exact pathology of this trouble (keratitis bullosa)? Have microscopical examinations been made in reference to a specific

organism? If so, what effect would the stronger antiseptics have in the treatment of both affections?

Dr. Colburn.—To the query, whether they would produce ulcer of the cornea, I would say this, that, I presume, if any of those vesicles were ruptured in an eye that contained any of the pus-producing microorganisms, you might get an ulcer following; but there must necessarily be some infection, and, the first form is pretty well guarded from infection, because it is evident from the investigations of Arlt that it has an epithelial lining membrane, and that would rather protect it from inoculation. In the case of pemphigus corneæ, where there are simply vesicles to break down, I presume that, if under proper conditions they were infected, an ulcer would be produced. I do not see why they should not be subject to infection as well as when a foreign body punctures the epithelial layer. The tears are so well provided with the power of destroying, washing out and keeping clean the conjunctival sac, that it seldom is infected. If the nasal duct and lachrymal sac are inhabited by organisms, I have no doubt they might extend and produce trouble.

Regarding the true pathology, I think very little definite of the first form is known. The examinations made by Arlt would seem to indicate that there is a new formation between the epithelial layer and Bowman's membrane, and that it is speedily reproduced. It will take four or five days for the new epithelium to extend over the denuded area, yet bullæ will appear within eight days from the time one has been destroyed. I do not think there is any microorganism entering into the cause of its formation.

Dr. J. J. M. Angear.—Charcot has taught us that certain ulcers follow disease of the spinal cord. Pathologists agree, I think, that herpes is the result of nerve irritation; that we have ulcers of the eye from the destruction of the optical branch of the fifth pair of nerves. I have listened to the paper attentively, and I thought if there was anything pertaining to the nervous system that was the real cause of these ulcers;

or whether pathologists have thrown out the least intimation with reference to this affection being a nerve trouble.

Dr. Colburn.—I purposely avoided the discussion of herpes, as it comes under an entirely different head. So far as I have been able to learn there is no relation between the nerve irritation and the formation of these vesicles; there may be indirectly in the simple vesicle. There you have a separation from the impinging of some foreign body on the cornea—a separation of the epithelial layer from its basement membrane, which may be due to paralysis of the terminal nerve supply. It is purely local, however, and it is simply the terminals that are so affected. Enucleation should be a last resort in cases where the constant irritation is exhausting the patient or threatening the fellow eye with sympathetic disease.

REFERENCES.

- Hasner, *Klin. Vorträge*, p. 196, Prag., 1860.
Arlt, (Ware) p. 134, 1885.
Landesberg, *Archives of Ophthalmology*, p. 135, 1877.
Brugger, *Monatsblätter f. Augenheil.*, xxiv Jahrgang, s. 500, 1886.
Hansen Grut & Horner, Noyes.
Berry, *Diseases of the Eye*, p. 81.
Mittendorf, p. 133.
Critchett, Jules. *Trans. Ophthal. Society*, Vol. 5, p. 46, 1884.

SYPHILITIC PLASTIC IRITIS; GUMMATOUS
(IRITIS PAPULOSA); GUMMA OF THE
IRIS; AND SYPHILITIC SEROUS
IRITIS.¹

BY G. E. DE SCHWEINITZ, M.D.,

Professor of Diseases of the Eye in the Philadelphia Polyclinic; Ophthalmic
Surgeon to the Philadelphia Hospital, etc.

It happens that the wards of the Hospital now contain an unusual number of cases representing the various types of syphilitic disease of the eye, and illustrating in a peculiarly happy manner the varieties of syphilitic affections of the iris.

The first patient that I present to you, a man in middle life, is convalescing from a bilateral attack of plastic iritis. As I illuminate the pupillary area, you observe the irregular character of the pupil, the margins of the iris being bound down in several points to the capsule of the lens, forming posterior synechiæ. The irides are slightly discolored, but there are neither nodes nor swelling on their surfaces. The general red injection of the eyeball, and particularly the fine area of ciliary injection, the so-called circum-corneal zone, more or less characteristic of inflammation of the iris and ciliary body, has well-nigh subsided. The pain, the slight discoloration of the aqueous and the faint haze of the cornea, which at one time were present, have likewise disappeared.

Necessarily a question of paramount importance in the treatment of every case of iritis is the cause of the trouble. If an examination is made of the dispensary service of any

¹A Ward Lecture at the Philadelphia Hospital.

large hospital, where great numbers of cases of general syphilis come for treatment, with reference to the question how many of them have had iritis during the course of their disease, the percentages vary, according to Alexander, from 0.42% to 5.37%. If, on the other hand, all cases of iritis which come for treatment are gathered together, and the percentage of those in whom the disease may safely be ascribed to syphilis is computed, the figures assume a very different proportion, varying according to Alexander, 28.7% to 75%. Consequently it may safely be assumed that about 50% of the cases of iritis are syphilitic in origin.

Simple plastic iritis, or that variety which I have just exhibited to you in the convalescing stage, is probably the most common form. The well known symptoms of iritis are present; namely, pain, lachrymation, dimness of vision with cloudiness in the aqueous humor, circumcorneal injection, discoloration of the iris, immobility of the pupil and the formation of posterior synechiæ; but the presence of an iritis of this character is not diagnostic of syphilis, in spite of the fact that a form of iritis quite indistinguishable in its clinical characters is frequently present in the secondary stages of syphilis. I want to impress upon you the fact that although syphilis is probably the most frequent cause of iritis, this form of iritis is not pathognomonic of syphilis. When it occurs during an attack of syphilis, it usually appears from six to eight months after the primary infection. Nearly always bilateral in the end, it is rarely simultaneously bilateral, one iris usually being inflamed before the other and more violently than its fellow. When treatment has been thorough, relapses, although they occur, are much less frequent than with the similar type of iritis which takes place under the influence of rheumatism. Like ordinary non-syphilitic plastic iritis, it may be acute, subacute, or chronic in its course, and, as has been stated, it possesses no clinical characteristics from which its cause may be positively established. According to the belief of some authors, however, there is in these cases really a

parenchymatous or condylomatous change not visible by ordinary clinical methods.

The second case which I show you is a patient in middle life presenting perfectly characteristic lesions. According to the history, we learn that the initial infection took place in the late summer of 1891, or between six and seven months before the date of the present examination. His forehead is covered with a coarse lesion, resembling those seen in the tertiary stage of this disease. They should, however, be classed with the papular syphilides, and represent the type which is sometimes called the irregular papular syphilide, not an early manifestation of syphilis, but one that may come on towards the end of the first year or the beginning of the second: The left iris presents characteristic features. You observe that the inner border of the pupil contains three circumscribed, yellowish tumors, somewhat larger than hemp-seeds, slightly reddish on their apices and crossed by a number of fine vessels. The remainder of the iris is intact, and there is an absence of the posterior synechiæ and binding down to the capsule of the lens which were marked features in the other type. There has been some pain, some pericorneal injection, and some lachrymation, but these have not been prominent symptoms.

There is a *parenchymatous* type of iritis, and the disease usually receives the name of *gummatous iritis*. In contradistinction to the plastic iritis of the preceding case, it is characteristic of syphilis, and from it alone the diagnosis may be made. Although not a common form of iritis, it occurs with considerable frequency. Thus, according to Alexander, in a collection of 414 cases of iritis by various authors, 74 of them or 17.8%, represented the type known as iritis gummosa. Among these authors, for example, Schmidt found in 47 cases of iritis, 7 of this variety; Knapp, among 26 cases, 5; and Coccius, among 42 cases, 5. In the wards of this Hospital from June 1, 1887, to December 31, 1889, among 61 cases of iritis which I observed, there were four presenting this type of iritis.

The development of this form of iritis in spite of its name,

does not belong to the late stages of syphilis, or to the stage of gummatous formations in the rest of the body. It may begin directly by the formation of the little yellowish-red nodes, either at the pupillary border or at the ciliary border, or less commonly between the tissues of the iris, or these phenomena may occur in the course of an ordinary plastic iritis, such as I have described to you. The points to remember are the characteristic appearance of the disease; the fact that it is pathognomic of syphilis; that it does not represent a late stage of the disorder; and that for this reason it might be well to adopt the name which has been given by Alexander and other authors, *iritis papulosa*, so as to contrast it with another type of syphilitic iris disease, to which I shall now call your attention, *gumma of the iris*.

The next patient which I present to you is a man about 50 years old, whose mental condition is such that it is practically impossible to obtain a satisfactory clinical history. He was brought here on the 28th of December with violent photophobia, both eyes inflamed, the conjunctivæ chemotic and the lids slightly swollen. He was cupped on each temple, and given saline purges and a free pilocarpine sweat. Atropine drops were instilled into each eye freely and ascending doses of potassium iodide were exhibited. Very shortly after his admission a curious type of delirium occurred, characterized by a fixed delusion of persecution, and afterward manifesting itself as an irregular type of delirium tremens, although many of the symptoms were closely allied to those which are produced by toxic doses of belladonna. Under treatment the violence of his ocular inflammation gradually subsided, and, although, as you see, there is still marked photophobia, I am able to demonstrate the lesions.

There is considerable haze of the cornea, and a large yellowish-white mass, not covered with vessels as in the other case of nodes upon the iris, which pushes its way toward the ciliary border and partially fills the anterior chamber. A few days there was in addition to this, a layer of pus at the bottom of the anterior chamber, forming a so-called hypopyon. The

other eye is similarly affected at the present time, the deposit having rather a whitish than a yellowish-white appearance, and also with a tendency to spread toward the ciliary region. There are no other definite scars and no other gummata in this man's body, but in spite of this fact I am inclined to look upon this as a gummatous deposit.

The presence of hypopyon associated with an iritis is very rare, and it is probably correct, as Alexander maintains, that whenever pus or blood appears in the anterior chamber, associated with syphilitic iritis, there is involvement of the ciliary body, or, in other words, an irido-cyclitis. This evidently is the case in this patient, and we are dealing here not simply with a lesion of the iris manifesting itself in a growth in the iris tissue which is probably gummatous, but also with extensive disease of the ciliary body, and, no doubt, if we were able to examine the interior of the eye, with lesions in the whole uveal tract.

The gumma of the iris belongs, as its name implies, to the late stages of syphilis, or, in other words, to the stage when gummatous deposits appear in other portions of the body. It presents the characteristics of a new growth, containing tissue that is but scantily supplied with blood-vessels, and with a tendency to undergo cheesy degeneration, leaving as a result of its presence, and after its absorption, a scar in the iris tissue to mark its original seat. Gummatous iritis, or, to use Alexander's term, iritis papulosa, on the other hand, presents one or more reddish-yellow nodules richly covered with blood-vessels, which readily absorb without the production of scars, the rest of the iris tissue being often practically intact. Even if we classify the present case as one of gumma of the iris, it should be remembered that we deal with an extensive disease of the ciliary body also, and probably with a gummatous irido-cyclitis so that the distinguishing features which I have just detailed are not typically manifest.

The last case which I show to you represents another type of iritis which occasionally occurs under the influence of syphilis, and which has been variously called *serous iritis*, *Descemi-*

titis or keratitis punctata,, receiving the last name because of an exudation in the form of dots, usually triangular in shape, upon the posterior layer of the cornea. It is an uncommon form in syphilis, and is generally preceded by some form of plastic iritis. Serous iritis occurs frequently under other circumstances. It is not rare with menstrual disturbances and in puerperal cases; it is one of the manifestations of sympathetic ophthalmitis, and may be brought into existence in the course of a variety of diseases. Syphilis is only one of its causes, and the occurrence of serous iritis must not be ascribed to syphilis until a number of other conditions, some of which I have mentioned, are eliminated. It is nearly always accompanied by changes in the deeper structures of the eye; vitreous opacities, choroiditis, alteration in the composition of the aqueous humor, and probably a catarrhal inflammation of the glands of the ciliary body, as has recently been shown by some beautiful investigations by Collins, in England. Hence, serous iritis is more accurately described as serous cyclitis, a name suggested some time ago by Priestley Smith. In contradistinction to plastic iritis, this disease is less likely to be accompanied by synechiæ. The anterior chamber may be deep in the beginning of the disease, but later on becomes shallow; the pupil is sluggish, sometimes semi-dilated, and the iris not necessarily attached to the capsule of the lens; the aqueous humor is often discolored; and the triangular collection of dots which you here see upon the posterior layer of the cornea, looking very much like minute drops of dirty water upon a clouded pane of glass, is characteristic. Sometimes the tension rises and the symptoms of glaucoma set in. You observe that this patient has other syphilitic lesions, namely papular syphilides belonging to a moderately late period, probably the beginning of the second year. As I have already stated to you, this form of iritis has developed after a plastic iritis with which he was affected some time ago.

In all the cases of iritis which I have shown you to-day the ordinary syphilitic treatment is efficacious. You may, in the earlier stages, give the protiodide of mercury in rapidly in-

creasing doses, until there is slight tenderness of the gums. This may be discontinued then, and potassium iodide may be substituted; or, as many of the patients come when it is desirable to get a very pronounced mercurial impression at once, it is our custom to give them mercurial inunctions, followed later by potassium iodide. In a few instances hypodermics of mercury have been used. My own experience is very much against this form of medication. It seems very well established at the present day that mercury is the proper remedy for syphilis at all stages, although you know it was once taught that in the later or gummatous period, especially if there was much cachexia, this was not a suitable remedy. It is a curious fact, however, that in true gumma of the iris, at least if I may be permitted to base an opinion upon two experiences, the resorption of the new growth was much more rapid under the influence of potassium iodide in massive doses than under influence of mercury. This accords with the statement of Alexander. I certainly would not advise you to use potassium iodide to the exclusion of mercury; but I would be inclined, in a gummatous deposit in the iris, to place a great deal of reliance upon it. Remember, when I say a gummatous deposit I do not refer to gummatous iritis, but to the disease which I have described as true gumma of the iris.

Locally, atropine is indicated in all cases save in serous iritis when there is a tendency to increase of intraocular tension and the fear that glaucoma develop. If pain is severe, leeching from the temple, hot applications and, if necessary, morphia, antipyrine or phenacetine, may be employed at night. Leeching not only allays the pain, but by relieving congestion of the iris, permits the absorption of the atropine and enhances its influence on the iris and peripheral ends of the oculo-motor nerve.

In conclusion, and in *resumé*, let me say that about 50% of the cases of iritis are syphilitic; and that in secondary syphilis we very often have a form of iritis quite indistinguishable from the ordinary plastic form of the disease, and presenting, so far as ordinary clinical methods are concerned, no features

which are diagnostic of the disease which may occasion it. We have another type of iritis characterized by the formation of one or more reddish-yellow nodes or papules, situated at the ciliary border, at the pupillary border, or sometimes between the two, while the rest of the iris remains intact, which absorb under anti-syphilitic treatment without leaving scars behind them, and which in spite of their resemblance to gummatous deposits, do not belong to the late or gummatous stage of syphilis, but represent a parenchymatous type of iritis and the true form of syphilitic iritis. There is also a form of iris disease characterized by the development of a single deposit partaking of the nature of a new growth, which is a true gumma, undergoing the degenerations more or less characteristic of gumma, and belonging with other gummata to the late stage of syphilis. Finally, we may have during syphilis, either independently of, or in the wake of, a syphilitic plastic iritis, an ordinary serous iritis, or, as it is often called, keratitis punctata. In this arrangements I have followed the classification given by the author whom I have several times quoted, and, as you see, have been able to demonstrate here in the wards the various types of the disease which show the accuracy of the classification.—*University Med. Mag.*

A NEW INSTRUMENT FOR QUICKLY DETERMINING REFRACTIVE ERRORS OF THE EYE.

BY ELMER STARR, M.D., BUFFALO, N. Y.,

Lecturer on Ophthalmology in the Medical Department of the University of Buffalo.

The refraction of an optically perfect eye is such that parallel rays of light entering it are brought to a focus on its retina. Any deviation from this condition constitutes an error of refraction, and requires for its correction some variation of the luminous rays from parallelism.

The generally adopted method of determining the refraction of the eye is to use test types placed at such a distance that the rays of light emanating from them may be regarded in practice as parallel; and the deviation from parallelism necessary to correct a refractive error is effected by placing a lens in front of the eye. Besides this procedure there are many other methods of changing the course of luminous rays coming from a test object. The single convex lens is the simplest means of varying the direction of luminous rays, and has for this reason been often used in optometry.

If an object is placed at the focus of a convex lens, the rays of light coming from this object will, after passing through the lens, be parallel. The farther the object is removed from the lens, the more the rays will converge after passing through it, and in this way the deviation necessary to correct an hypermetropia may be obtained. On the other hand, if the object is brought from the focus nearer to the lens, the rays which

leave the lens will be divergent; and this change is such as to adapt it to the refractive condition of a myopic eye.

Coccius, von Graefe, Badal, and others have made use of this principle in constructing optometers, the test objects of which consist of threads or lines, or of letters and figures placed at the focus of a lens of three or four inches focus.

All these optometers have that disadvantage that they provoke a certain effort of accommodation, inasmuch as the observer is conscious of the proximity of the test object. It is important that the accommodation be excluded in determining the static refraction of the eye; otherwise, the dynamic being added to the static refraction, the real error may be masked.

Then, too, some of these instruments do not serve to determine the visual acuteness because of the change in the size of the retinal image which they produce; the measure of visual acuteness is given by the size of the retinal image, and the acuteness of vision in one eye is comparable with that in another only when we know the size of the smallest retinal image that each can distinguish.

An optometer is fitted for the simultaneous determination of visual acuteness and refraction only on condition that the retinal images of all eyes examined by it have the same size.

The instrument here described fulfills these conditions completely, and has none of the disadvantages of the single convex lens.

The Instrument consists of a cylindrical tube about 15 ctm. long, mounted on a stand, which admits of its being regulated for height and inclination. Within the tube a 16 D. convex lens (P, Fig. 1) is fixed, at a point $6\frac{1}{4}$ ctm. from the proximal end; that is, at just the focal length of the lens. Beyond the convex lens, and moved by means of a rack and pinion, is a concave 15 D. lens (M, Fig. 1). The effect of this concave lens is to render parallel rays divergent, but this effect is neutralized by the convex glass when the two lenses are in contact. When, however, the two lenses are separated from each other, the convex glass more than neutralizes the divergence caused by the concave glass and the rays are made to

converge. The action of the system will be better understood by reference to Fig. 1.

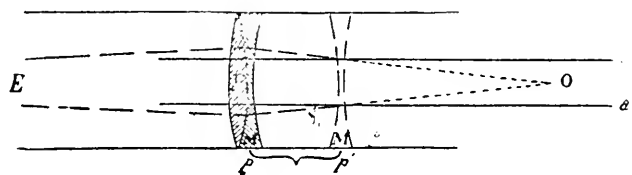


FIG. 1.—When M and P are in contact, rays $a a'$ continue in their original direction. The effect of moving M from $p p'$ is shown by the broken line.

The eye whose refraction is to be tested is situated at the end of the tube at E. The effect of the concave lens M upon the parallel rays $a a'$ is to cause them to diverge, so that they leave the glass in a direction as if they came from the point o , which is the focus of the lens M, which in this case is $6\frac{1}{4}$ ctm. in front of the glass. The effect of the convex glass P, then, upon the rays $a a'$ is the same as if the rays proceeded directly from the point o ; in fact, the point o may be considered, in this respect, as the object. Now, as already stated, when an object is placed at the focus of a convex lens, rays of light coming from this object will, after passing through the lens, be parallel; and if the object be removed from the lens the rays will *converge* after passing through it. So that, if the lens M be brought into contact with lens P so that o falls in the focus of lens P, the rays $a a'$ will leave P parallel; and if the lens M be moved away from P so that o falls outside the focus of P, the rays $a a'$ leave P *convergent*, and the amount of the convergence depends upon the distance of o from P—that is, upon the distance the lenses M and P are separated. Calculation shows that for every $\frac{100}{256}$ ctm. the lenses are separated, the effect is the same as a one-diopter convex lens, or $+1$ D.; or a separation of the glasses 6.25 ctm. is identical with a $+16$ D.

lens.¹ It will be seen, then, that every possible degree from zero or nothing up to + 16 D. can be obtained with this combination. For any concave or minus combination it is only necessary to place in the proximal end of the tube at E a minus lens of such power as to neutralize the converging rays coming from the lens P when M and P are $6\frac{1}{4}$ ctm. apart. That is, when the lenses stand in this position, their effect is just neutralized by a concave 16 D. lens placed in the end E of the instrument, and the rays of light then leave this lens parallel again and the combination once more stands at zero. If now the lenses M and P are brought nearer together, the result is a combination *weaker* than + 16 D., so that the concave lens at E more than neutralizes this effect, and the rays leave the instrument *divergent*, or as they would after passing through a single concave lens; so that by this means every possible degree from 0 up to - 16 D. can be obtained.

In practice the tube of the instrument is graduated with a scale showing dioptries and half-dioptries, and the frame of the movable lens M carries a pointer which indicates the number of

¹The formula for determining the effect of a given separation of the lenses in this instrument becomes the same as the formula for determining the point at which the image made by a convex lens falls when the distance of the object from the lens is given. For the focus of the *concave* lens is virtually the object, and its distance from the *convex* lens manifestly depends upon the distance the lenses are apart.

Let f denote the focal length of the convex lens P; d , the distance of the object (focus of concave lens) from P; and x the focal length of the resulting combination.

Then the equation $\frac{d-f}{f} = \frac{f}{x-f}$ will give the value of any given movement of the concave lens M.

Suppose the lens M be moved away from P 0.25 ctm.; then the distance of object is 0.25 ctm. (focus of M); or $d = 6.50$ ctm. Focus of P = 6.25 ctm., or $f = 6.25$ ctm.

Substituting these values in the equation, we have

$$\frac{6.50-6.25}{6.25} = \frac{6.25}{x-6.25}, \text{ whence } x = 162.50.$$

That is, the focus of such a combination falls 162.50 ctm. behind the lens P. But the lens P is placed 6.25 ctm. in front of the eyehole of the tube, hence the focus falls 162.50 ctm. - 6.25 ctm. = 156.25 ctm. behind the eye. A glass of 156.25 ctm. focus is $\frac{64}{100}$ of a diopter, or 0.64 D. Therefore, separating P and M 0.25 ctm. equals + 0.64 D. From this it is easily calculated that the effect of moving M $6\frac{1}{4}$ ctm. away from P is equal to a + 16 D lens.

dioptries corresponding to the amount of separation of the glasses. A disc having a stenopæic slit and fitting into the end of the tube serves to determine the refraction of each meridian of the eye separately.

The advantages of this combination are decided, as it allows of the use of the ordinary test type placed at the usual distance, so that no effort of accommodation is caused by the proximity of the test object. Then, by this arrangement, the anterior focus of the eye is kept at the focus of the convex lens of the instrument, so that no enlargement of the test object is produced. In other words, the conditions are most favorable for determining the actual refraction of the eye.

SPONTANEOUS CURE OF DETACHED RETINA.

Marchetti (*Rif. Med.*, January 16, 1892) reports the following case: A man, æt. 55, observed during November, 1890, that the vision of his left eye was becoming dim. This dimness increased very rapidly, and in four days there was left only perception of light. Examination revealed extensive detachment of the temporal and frontal portions of the retina, and of a great part of the nasal portion. The detachment fluctuated in the lower portion with the ocular movements; in the other parts it was distended in folds. Tension was reduced, vitreous transparent, and disc normal. Vision was restricted to P. L., and perception of movements of the fingers in the temporal section of the field of vision only. Vision had been previously good, but each cornea had a central leucoma, the remains of inflammation many years previously. He was treated with pilocarpine injections and iodide of potassium, and advised rest in the horizontal posture. In February, 1891, having continued the treatment till then, the eye was in the same condition, when quite suddenly, on the 16th, he regained his sight. This followed, apparently, on a sudden rotation of his head towards the right side, the patient feeling immediately, as it were, a blow on his useless eye. Directly after this he found that he could see objects distinctly and without any difficulty, and eight days after he could read small type quite easily. In June, when he again presented himself for ophthalmoscopic examination, there was a light grey streak corresponding to the detachment, but no displacement whatever remained. The field of vision was nearly normal, save for colors, and the acuity nearly as good as before, having regard to the existence of the old leucomata. The author is inclined to attribute the sudden cure to a rupture of the detached portion, with escape of the subjacent fluid.—*Brit. Med. Jour.*

OBITUARY.

SIR WILLIAM BOWMAN, BART., LL.D., F.R.S.

BY SWAN M. BURNETT, M.D., WASHINGTON, D. C.

The last of the great trio who assisted at the birth of modern ophthalmology is gone. The youngest, Albrecht v. Graefe, went first, more than twenty years ago, and the oldest, Sir William Bowman, closed his earthly career through an attack of pneumonia on March 29, of this year; and almost his last literary work was a tribute to the memory of the other—Donders—whose death is yet fresh in the minds of all.

There were strong men before Agamemnon and there have been strong men since, but there is only one Agamemnon who has served as a type of power and a tower of strength. In science, in art, in literature there have always been men who reared as peaks above the level plains of mediocrity, some higher, it may be, than others, but each distinct and with a character of his own and in no sense a rival of the others.

In ophthalmology Bowman was such a man. His position was unique, and came from a combination of circumstances and personal qualities which will never be repeated. He wrote less than either Donders or von Graefe and yet the impress he left upon the scientific world and the generation in which he lived is, without question, greater than that of either of the other two, and this largely through his character as a man. Those who have been brought for any length of time in contact with Sir Wm. Bowman will understand why he stands as a model upon which younger men should seek to mould their

professional lives. While conservative in the best sense, he was always receptive of new truths and facts, and ready and eager to adopt whatever was offered, with fair promise of gain, from any source. He had that rare possession—an open yet judicial mind. A nature calm and serene, and a temperament so justly balanced that it seemed almost impossible to disturb its equanimity enabled him to spend a long life in arduous labor as a teacher, investigator and practitioner in the metropolis of the world, in defiance of a physical organization which was the reverse of robust. Many men much stronger physically would have succumbed to the enormous draughts made upon him during the years of his active career when he did the largest private practice of any one in London.

Many of those who knew him only as an ophthalmologist are not aware that before he attained to eminence as an ophthalmic surgeon he had done work in anatomy, histology and physiology and general surgery which was sufficient in itself to place him high in medical science. He was the first to popularize histological study and investigation among medical students in London, and his work on the minute anatomy of the kidney is the basis of our knowledge on this subject to this day.

In collaboration with Dr. Todd he wrote a physiology which was the best of its time and in 1849 he published his most elaborate single work in ophthalmology—on the anatomy of the eye—which can be read with profit by the student of to-day. But it is as a teacher and an ophthalmic surgeon that his fame will be most enduring. In the zenith of his career as an ophthalmic surgeon he was *facile princeps*. By education, training and temperament he was in every way qualified to stand at the head of operators on the eye. He had a knowledge of the minute anatomy of the eye unsurpassed by any one of his time, and an acquaintance with its physiology second to none, while his manual dexterity as an operator gained from his long and ample experience as a general surgeon was absolutely perfect. To see Bowman operate was an esthetic pleasure.

He was the son of John Eddowes Bowman, a distinguished naturalist, and was born at Nantwich, July 20, 1816. He was educated at a school in Birmingham and it was, as he told me, an accident that happened to him at that time which determined his future career. An injury to his hand called in the services of Mr. Hodgson, a surgeon to the Birmingham General Hospital and the school boy was so charmed with the manner in which it was treated and so interested in watching the treatment that he resolved then to be a surgeon, and as soon as it was possible he entered the hospital as an apprentice. He began then that systematic method of studying and recording cases which went far to make him what he afterward became. It has been my privilege to see these early records full of accurate drawings to accompany the detailed history of cases which he made at that time, and they are models in case-taking. He left Birmingham to enter Kings College in London in 1837, and in 1839 was made a member of the R. C. S., and was, the same year, appointed demonstrator of anatomy as well as curator of the museum at the College. He was made a F. R. S. in 1841. In 1848 he was appointed Professor of Physiology in Kings College. He received his appointment as Assistant Surgeon to the Hospital in 1840, but was not made full surgeon until 1856.

But it was at the Royal London Ophthalmic Hospital at Moorfield that his great work in ophthalmology was done. Bowman was actually forced into an exclusive ophthalmic practice, and much against his inclination. His fame as a skilful operator and a careful diagnostician became so widespread that the profession in London, without any solicitation from him, threw the whole of their ophthalmic work into his hands, and he was so overwhelmed with it that he had no time for any thing else.

The "Reports" of the Moorfield Hospital contain most of his written contributions to ophthalmology, but his greatest work was done at that little desk in the large consultation room of the Hospital around which have gathered hundreds of eager students from all parts of the world to listen to the words of

wisdom that fell from his lips. But it was more than the clear demonstration of the clinical features of the cases or the lucid exposition of diagnosis that these students learned at that desk. They carried away with them to their distant homes an untangible something which made itself felt in all their subsequent professional lives, and affected in a greater or less degree, according to their temperament, their future aspirations and ambitions. They had lived during that time in the atmosphere of a truly noble character whose modesty, unostentation and simplicity were equaled only by the force of the intellect which held all its resources under perfect control. The work of such a life can not be computed in figures or recorded in statistics.

A few years ago his Queen conferred a baronetcy upon him in recognition of his eminent services to science and humanity. His later years have been spent in comparative retirement at his beautiful country place among the Surry Hills and amidst the gardens of flowers he tended with such affectionate care; but to the last his interest in all the scientific matters in the study of which his life had been spent was unabated.

Thus has ended, in its 76th year, a life which was as successful, from the highest point of view, as can fall to the lot of humanity.

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

MAY, 1892.

No. 5.

ORIGINAL ARTICLES.

CONCERNING MUSCULAR ADVANCEMENT.¹

BY LUCIEN HOWE, M.D., OF BUFFALO, N. Y.

The methods of advancement of the ocular muscles have been varied so much in their details, that it would be out of place in a paper before an audience not entirely made up of students of ophthalmology, to treat all of these modifications separately. At present, therefore, I wish to call attention to two or three points in this connection. Every one knows, of course, that this operation for the relief of strabismus consists in loosening from the point of its insertion into the sclerotic a muscle which is too weak, and bringing it forward, to attach it nearer the cornea. The fact that this procedure is, by some operators, avoided when possible, and that when resorted to the average results are by no means satisfactory, shows that the technique of it has not yet been properly formulated. In this state of uncertainty, therefore, it seems worth while to offer any further suggestions, however simple.

As the first step, I think, the opposing muscle should be

¹Read before the New York State Medical Society.

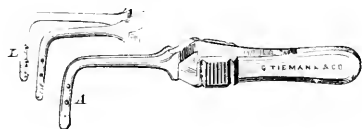
divided, certainly when the degree of strabismus exceeds two or more lines. As the operation is usually made to correct a divergence which has resulted from too free tenotomy of the internal rectus, the first act is naturally to divide the external rectus. It may seem superfluous to mention this, so general has been the adoption of that plan, but, on the other hand, I know that it is not followed by some operators whose reputation for skill is otherwise unquestioned.

Second. It is of importance to retain a hold on the muscle to be advanced, for if not, this retracts into the surrounding tissue and it is virtually impossible to find it. Various methods have been employed to obviate this difficulty. One of the simplest consists in introducing two or three stitches either in the line of the attachment of the muscle or at the upper and lower edges at right angles to it, and after the division is made, using these threads for drawing the muscle forward into its place. Theoretically, this is a very attractive method, but practically it necessitates considerable loss of time, and as a general anesthetic is usually necessary in these cases, the operator is too often interrupted by the restlessness or vomiting of the patient. In order to do away with this, DeWecker long ago proposed a clamp with which the tendon of the muscle could be retained after being once isolated. This simplified the operation, but it was soon found that the clamp was clumsy and that if the patient struggled after it was once introduced, it was sometimes necessary to relax the hold obtained, thus defeating the very object for which it was used. In order to do away with this objection, it seemed advisable to have the clamp made very short and light, in order that having once been fixed in position, it could be left, irrespective of the movements of the patient.

Such a clamp I had made some few years ago and it has proved so useful at various times, that simple as it is, it seems worth while to call attention to it now. It consists of nothing more than a pair of forceps about an inch long, with crossed branches, the clamp portion about a quarter of an inch long, turned at right angles and provided with three teeth, which fit

corresponding depressions on the opposite branch. The whole is made as light, and the spring as strong, as possible.

After the tendon is exposed, the smooth blade of the forceps is passed under the muscle and its end firmly clamped, leaving sufficient space without difficulty. This having been done, the operator can take his own time in dividing the tendon, introducing the stitches, resecting a portion of the muscle if necessary—or in general, he is able to manipulate the muscles with perfect ease, and if, meanwhile, he is interrupted by the struggles or vomiting of the patient, the clamp is simply left in place, it being so small as to give no inconvenience whatever.



The next point to which I would direct attention, is the introduction of the stitches. I have tried different plans and have gradually come to the conclusion that the best results can be obtained by a modification of the method first advised by Dr. Prince, of Jacksonville, Ill., and called by him the loop suture. It is well known that he introduces one stitch parallel to the line of the incision in the conjunctiva,—that is, tangent to the cornea and almost touching it, and that the two ends of this thread are then tied together. Next, a thread is armed with two needles, each being passed through the muscle from within outward, transfixing that and the conjunctiva also and the two ends of the stitch are tied, after one end has passed through the loop near the cornea. The muscle is in that way brought forward. If found that the correction is too great, the stitch can be loosened, or if the correction is not sufficient, the muscle is drawn a corresponding distance further forward by tying the stitch tighter.

Theoretically, this is almost the ideal operation, but practically there are two great objections to it. The muscle is apt to slip upward or downward as the loop stretches in various directions. Thus it is impossible to foretell with exactness whether the muscle will not attach itself a little too far upward or downward on the globe, giving subsequently a proportional displacement. The second disadvantage of this method is in the puckering of the conjunctiva, not infrequently an unsightly projection being left over the point where the muscle is attached to the globe. I have found that both of these difficulties could be obviated by arranging the stitches differently.

First, a stitch is introduced at the same place and in the same manner as he suggested, and then, being tied in the center at the point nearest the cornea, the needle is again placed under the conjunctiva at that point and this end of the thread is tied with the other end of the same suture. In other words, the one loop is then divided into two and it forms what might be called a "B"-shaped loop.

Second. In order to draw the muscle forward, two stitches are used. One passes from the upper edge of the muscle and corresponding part of the conjunctiva, and being passed through the upper part of the opening of "B"-shaped loop. The lower stitch is passed in the same way through the lower edge of the muscle and then through the lower portion of the "B"-shaped loop. Then, by tying the corresponding ends of these two stitches above and below, the muscles brought securely into the position which it should occupy, neither too far above nor below. Moreover, as it then rests closely upon the sclerotic, there is either no projection of the conjunctiva, or so small a fold as may be easily removed.

In spite of all precautions, it must be admitted that the operation does not give uniformly good results. I have been convinced of this both by a considerable series of cases in my own private practice, in which different methods have been tried, and especially by studying the results reached by some

of the most enthusiastic advocates of the operation. In selected cases, of course, we all obtain a large proportion of beautiful results, but so long as in the average there is so much to be desired, any improvement on the operation technique, however slight, seems worthy of record.

A CASE OF RECURRENT ŒDEMA OF THE UPPER
EYELID AS A SYMPTOM OF NASAL
POLYPUS.

BY JOHN DUNN, M.D., OF RICHMOND, VA.

Miss A., æt. 19, gave the following history: About two



weeks before coming under treatment, the upper lid of her

right eye became suddenly red and swollen, without this condition being accompanied by any pain. She had applied hot applications with the result that after some hours the swelling disappeared. The present swollen condition of the upper lid had appeared about two days before, and apparently without cause. Hot applications this time failed to reduce the swelling. The appearance presented by the upper eyelid is well shown in the cut (from a photograph taken at the time). The œdema seemed to affect only the loose connective tissue below the skin of the upper lid, which was considerably swollen. The surface of the upper lid was rather erythematous in appearance than showing the dark red inflammation. The eyelid was not painful, and was inconvenient only because of its "weight." There was no sign of any localized inflammation to cause this condition. An examination of the nasal cavities showed that the anterior part of both middle turbinates was undergoing myxomatous degeneration, and that both were so enlarged as to entirely occlude the space between the septum and the outer wall of the nasal cavity, and that both were the source of polypi which extended some distance below the middle turbinates. The middle turbinate on the right side was, however, the larger of the two. As much of the degenerated middle turbinates as could be removed at one sitting was snared off, and by the next day the œdema had disappeared. The explanation of this œdematous condition is probably to be sought in a vaso-motor paresis of the vessels to the upper lid, a reflex from the area irritated by the myxomatous middle turbinate of this side.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, MARCH 10, 1892.

HENRY POWER, F.R.C.S., PRESIDENT, IN THE CHAIR.

THE MINUTE ANATOMY OF PYRAMIDAL CATARACT.

Mr. Treacher Collins read a paper based upon the microscopical examination of six eyeballs. The cases formed a series in which the interval between the formation of the cataract and the excision of the eye varied from six weeks to twenty-one years. The earliest changes consisted of a localized disturbance and proliferation of the epithelial cells which line the hyaline capsule at the anterior pole of the lens, and consequently some elevation of the capsule. The lens fibers immediately beneath these proliferated cells underwent partial destruction, resulting in a shallow excavation of the lens substance at this point. Pyramidal cataracts of longer duration were found to have a layer of cells between the opaque part and the subjacent unaltered lens substance. These were continuous with, and apparently derived from, the cells lining the anterior capsule elsewhere. In two cases of some years' duration there was, between the opacity and the lens substance, in addition to the layer of cells, a layer of hyaline capsule, presumably secreted by the cells. Mr. Collins thought these observations helped to explain the readiness with which the pyramidal opaque portions sometimes became detached on being touched with a needle; for such a touch only completed

a separation which had already been partially effected by natural means. He considered that they also threw some light on the development of the lens capsule; for if the epithelial cells lining it were capable, on the application of a morbid stimulus, of secreting a hyaline layer identical in all respects with it, the inference that the capsule was originally formed by such a secretion seemed a reasonable one. Mr. Collins challenged the statement which had been made, "that in the majority of cases pyramidal cataract was found associated with a perfectly transparent cornea." This, he thought, could only be proved or disproved by the pathological examination of a large number of eyes with opaque corneæ, and he questioned if this had been done by those responsible for the above assertion. In his six cases the cornea was the seat of old or commencing opacity. The paper was illustrated by lantern slides made from photomicrographs.

Mr. Tweedy spoke of the rarity with which opportunities occurred for the microscopical examination of pyramidal cataract. He showed a sketch he made many years ago of the appearances of the lens capsule in a case in which perforation of the cornea and escape of the lens occurred during ophthalmia neonatorum. He was of the opinion that inflammatory material was first deposited on the lens capsule, and set up an intra-capsular cell proliferation. He demurred to Mr. Collin's view that the lens capsule was entirely produced by the cells lining it, and thought that this organ was partly epiblastic, partly mesoblastic. He had only once seen a case of pyramidal cataract with perfectly clear corneæ.

Mr. Nettleship had on one occasion examined sections of a lens with pyramidal cataract, and found that the capsule passed in front of the opacity. He was unable to say if the capsule was split into two layers, as in some of Mr. Collins's specimens.

Mr. Collins, in reply, said that he would divide cases of opacity at the anterior pole of the lens into several groups, and to only one of these could the term pyramidal cataract be properly applied. He maintained that the structure of the

lens capsule and the character of the diseases which affected it were evidence of its epiblastic origin.

THE PHYSICAL FACTOR IN CONICAL CORNEA.

Mr. Tweedy presented this communication to the Society, in extension of some remarks he had made at the previous meeting. He said that several hypotheses had been brought forward in explanation of the cause of this curious disease; there were:

1. Increased intra-ocular pressure.
2. Malnutrition and atrophy of the central part of the cornea.
3. Diminished resistance power.
4. An inherent weakness of the corneal structure.

He thought the last hypothesis was most in conformity with observed facts, and this inherent weakness he considered was best explained by imperfect completion of the developmental processes. In early fœtal life the gap in the embryonic cornea, caused by the involution which gave origin to the lens, was filled up by cells, beneath which was a homogeneous layer. Into this layer an intrusion of mesoblastic tissue took place, and extending centripetally, gradually closed over the central part, which was, however, the last part to be formed. This mesoblastic tissue was the fœtal cornea, and the physical factor of conical cornea consisted in imperfect growth of the central portion of this layer. No other explanation, he thought, would account for the conical shape assumed by the cornea when thus diseased.

The President asked if Mr. Tweedy's hypothesis would explain the onset of keratoconus in adult life.

Mr. Brailey mentioned that he had once made a microscopic examination of a portion of conical cornea removed by operation, and found a small cavity just beneath the epithelial layer. He referred to the fact that conical cornea in some cases developed for a time, then appeared to become stationary, and subsequently underwent rapid increase.

In reply, Mr. Tweedy said he did not wish to exclude the

agency of other factors in the causation of conical cornea, but merely to draw attention to what he thought was the true physical factor.

LIVING AND CARD SPECIMENS.

Dr. Rockliffe (Hull)—Case of Unilateral Proptosis.

Mr. Hartridge—Case of Double Lacrymal Fistula, probably congenital.

Mr. Work Dodd—Scleroderma of Lower Eyelid and Cheek.

Dr. D. J. Wood—1. Diseases of Retina and Choroid with Detachment of Retina; 2. Double Congenital Coloboma in Fundus.

Mr. Tay—Bleaching of Eyelashes and Eyebrows in Sympathetic Irido-cyclitis.

Mr. Lawford—Reversible Spectacle-Frame.

Mr. Holmes Spicer—Keloid in Scars of Herpes Ophthalmicus.

Mr. Wray—New Vascular Growth in Vitreous.

—*Ophth. Review.*

NEWS.

AN ACT FOR THE PREVENTION OF BLINDNESS.

Through the kindness of Dr. F. T. Rogers we are enabled to give the following item to our readers.

State of Rhode Island and Providence Plantations. Chapter 1056. Passed April 19, 1892. It is enacted by the General Assembly as follows:

DUTIES OF MIDWIFE OR NURSE.

SECTION 1. Should any midwife or nurse, or person acting as nurse, having charge of an infant in this State, notice that one or both eyes of such infant are inflamed or reddened at any time within two weeks after its birth, it shall be the duty of such midwife or nurse, or person acting as nurse, so having charge of such infant, to report the fact in writing within six hours to the health officer, or some qualified practitioner of medicine, of the city or town in which the parents of the infant reside.

DUTIES OF HEALTH OFFICER.

SECTION 2. Every health officer shall furnish a copy of this act to each person who is known to him to act as midwife or nurse in the city or town for which such health officer is appointed, and the Secretary of State shall cause a sufficient number of copies of this act to be printed, and supply the same to such health officers on application.

PENALTY.

SECTION 3. Every person who shall fail to comply with the provisions of this act shall be fined not exceeding one hundred dollars, or imprisoned not exceeding six months, or both.

SECTION 4. This act shall take effect July 1, 1892.

OFFICE OF THE SECRETARY OF STATE, }
Providence, R. I., May 11, 1892. }

A true copy, Attest:

GEO. H. UTTER, Secretary of State.

MEMORIAL PAVILION TO DR. ABRAM DU BOIS.

The family of the late Dr. Abram Du Bois have announced to the Trustees of the New York Eye and Ear Infirmary their intention of presenting the sum of \$80,000 for the erection of a new pavilion as a memorial of Dr. Du Bois, who for nearly fifty years was attending and consulting surgeon to the Institution, and was always one of its most devoted friends and munificent benefactors.

THE SECTION OF OPHTHALMOLOGY OF THE
PAN-AMERICAN MEDICAL CONGRESS.

This Section has been organized with Dr. Julian Chisolm, of Baltimore, Chairman, and Dr. George M. Gould, editor of the *Medical News*, of Philadelphia, Pa., English speaking Secretary.

SELECTIONS.

NOTES ON PLASTIC OPERATIONS ABOUT THE EYELIDS.¹

BY J. MORRISON KAY, M.D.,

Lecturer on Ophthalmology, University of Louisville.

The parts about the eyelids, on account of their great vascularity, present a fertile field for the employment of the surgeon's ingenuity in relieving deformities by plastic operations. Under modern surgical methods large portions of skin can be successfully transposed bodily to the eyelids, and extensive deformities can be corrected by sliding, twisting, and pedicled flaps. A number of operations of this character are described and pictured in books on ophthalmology and general surgery. Yet most deformities about these parts differ so in the amount of distortion present that each case is a study in itself, and can not always be corrected by following the stereotyped operation. During the last few years I have seen several cases calling for surgical interference for the relief of unsightly deformities in this locality. Two such cases I have presented to this Society. They were cases of extensive burns of the entire side of the face, in which there was so much cicatricial tissue that no operation of a shifting or sliding nature could be considered. In one I transplanted a piece from the arm, and, while most of the flap adhered in its new position, the contraction that followed very much lessened the ultimate good result. In the other case the edge of the lids were freshened,

¹Read before the Louisville Medico-Chirurgical Society, April, 1, 1892.

dissected up, and brought together by interrupted stitches. In a few days, when the surface left after the dissection began to granulate, transplantation of small particles of skin from distant parts was instituted, and the granulating surface covered. This case was an extreme one, and the result all that could be desired, relieving the patient of an acquired morphine habit and curing a large ulcer, which had developed from exposure of the cornea and inability to close the eye during sleep. Besides these cases I have encountered a number of less severity that were relieved by the ordinary methods in vogue. At the last meeting of the American Ophthalmological Society cases were reported wherein the method of Thiersch was adopted, and I have been on the lookout for a case in which I could try it. This consists in covering the granulating surface with flaps of epidermis shaved off very thin with a razor; several pieces can be employed to cover one surface. The advantage claimed for it is, that the pieces are more apt to adhere than when the entire thickness of the skin is used, and the contraction that follows is much less. The entropion and trichiasis that follow cicatrization of the conjunctiva in the late stages of granulated lids is often a difficult condition to remedy, and, upon examination of the text books and current literature, one is amazed at the number of methods advised for its relief. Where the ingrowing of the lashes is the most prominent symptom, the operation most often instituted is a partial or complete removal of the hair bulbs, so-called scalping of the lid. This barbarous mutilation, practiced so extensively as a recognized surgical procedure, should be relegated to obscurity, since it rarely accomplishes the purpose for which it was intended. I have only attempted it once, and my experience in this case and observing the results in the hands of others, I believe it should never be instituted. In its stead I have tried electrolysis where the hairs were few in number or scattered throughout the length of the lid, and transplantation where the inturning was extensive.

In a case where simply one large bunch of cilia turned against the cornea I tried a method successfully that I have

tried several times, yet can find no record of it in literature. It consists in splitting the free edge of the lid back of and corresponding with the location of the offending lashes. After the hemorrhage has stopped and the incision is made to gap well, I have inserted small pieces of skin removed from the arm, thus introducing a wedge that will nearly always live and form a support that effectually pushes the lashes away from the cornea.

Where the trichiasis is more extensive I have instituted the well known operation of Jaesche-Arlt. This consists in splitting the lid along its free edge, well back of the hair bulbs, then removing an elliptical piece of skin from the outer surface of the lid and by stitches closing the wound, thus drawing the strip containing the lashes well up, and allowing the incision along the free edge of the lid to gap widely and heal by granulation. This operation will fail where the tissues of the upper lid are abundant and lax, for the contraction in the conjunctiva will continue, and in a short time, to our dismay, the lashes are again found rubbing against the cornea.

I have recently operated on a case in which there was intense trichiasis with much redundant tissue and laxity about the lid; I first cut the external canthus, hoping that by dividing the external canthal ligament I would lessen the tendency to incurving of the edge of the lid, and thus carry the lash away from the cornea. This, however only had a slight effect, and I then performed the following operation: The incisions were the same as in the Jaesche-Arlt operation, which I have just described, yet when the elliptical piece of skin was dissected up it was left attached at its base, the sutures were introduced and then the flap was turned and placed in the gap along the free edge of the lid. Only a few stitches were required to hold the flap in the new position. In a few days it had firmly united, then it was cut off at its base and the stitches removed. Now, only two weeks after the operation, there is found a support for the lashes and effectually preventing them from coming in contact with the cornea. As contraction goes on the ridge now visible will lessen and the lashes will assume

their normal position, yet be prevented from touching the cornea. I was surprised at the readiness and quickness with which the narrow strip of skin adhered to its new position.

Usually in addition to the ingrowing lashes we have an in-turning of the edge of the lid, so-called entropion, and then the operator must aim at a restoration of the lid border as well as the cilia. The modification of Von Burow's operation by Green has seemed to me to be the most effectual. In this operation an incision is made on the conjunctival surface of the lid about two lines from its free edge, extending from the outer to the inner corner. It includes both conjunctiva and tarsus. Then on the skin surface an elliptical piece is removed and a number of deep sutures are introduced, going through the orbicular muscle, and in tying them the edge of the lid is turned as far out as possible. The cut on the conjunctival surface gaps, and is left to granulate. This operation will also fail if there is an abundance of lax tissue in the lid. I think that this operation can be modified in the same manner as the one I have described, namely, the elliptical piece of skin left attached at its base, and be twisted into the gap on the conjunctival surface. The objection to it would be that the piece transplanted is skin and the gap to be filled is in mucous membrane. I believe that if its base be cut as soon as we are certain of its viability, that in a short time it would be transposed into mucous membrane. I once saw the late Dr. Agnew transfer a piece of skin from the outer surface of the lid into the orbit and make a *cul-de-sac* for the purpose of retaining an artificial eye. The case, when I last saw it, showed evidence in the flap of transformation going on from skin into mucous membrane. This is most likely to occur if the connection to the skin by the base be cut as soon as evidence of life in the flap is shown. I have attempted several operations in transplanting mucous membrane in the treatment of symblepharon, or adhesions between the eyeball and eyelid, but my success has not been such as to call for particular comment.—*American Practitioner and News.*

A PICTURE OF HEREDITARY NYSTAGMUS.

BY CASEY A. WOOD, C.M., M.D.,

Professor of Ophthalmology, Chicago Post-Graduate Medical School; Oculist and
Aurist, Alexian Brothers' Hospital.

The origin of that clonic spasm of the ocular muscles which is commonly designated nystagmus is wrapped in a mystery as impenetrable as any one has to deal with in the whole range of pathology. The natural history of the affection teaches us, among other things:

1. That it is nearly always associated with some central brain, or spinal lesion, or some cause of deteriorated vision, such as errors of refraction, albinism, diseases of the ocular media, etc.
2. It may be acquired in adult life, but
3. Is usually congenital, or develops in infancy or early childhood.
4. It commonly persists through life, and
5. Its hereditary character has not been established.

Most writers¹ assign one or, at most, two sets of causes to the various forms of nystagmus, but the evidence before us surely points to at least five kinds of origin:

1. The acquired variety—with or without refractive errors, muscular weakness, or pre-existing disease of the eye itself, the best example of which is seen in miners—certainly points to a purely peripheral origin. It is one of the "professional" hyperkineses and is exactly like piano player's spasm and the tremulous form of writer's cramp. The unsteadiness in such instances usually disappears when the overworked muscles are given a sufficient rest.

¹An elaborate paper on this subject is E. Raehlmann's "Ueber den Nystagmus und seine Ätiologie." Graefe's Archiv. f. Ophthalmologie, Bd. xxiv, iv, p. 237.

2. It is almost certainly the result of *anomalous or defective cerebral development* in those congenital cases where the eye is otherwise healthy and the vision normal.² It also has a central origin in instances where other brain malformations are plainly marked

3. When it accompanies such central diseases as multiple sclerosis, Friedreich's disease, etc., it is, in all likelihood, merely a symptom of the associated affection.

4. As Noyes says, the nystagmic movements are due in some cases to the absence of a motive for binocular fixation. The muscular region is then not more sensitive to form impressions than surrounding retinal areas, and the eyes see equally well (or badly) in whatever position they may assume. In this category I would place nystagmic albinos.

5. Probably in the majority of instances the nystagmus results from a combination of some of the foregoing causes.

In view of the doubts³ thrown upon the hereditary character of nystagmus, I place in evidence the following genealogical table. To date, twenty-three children and grandchildren have resulted from the marriage of A, a pronounced blonde, with perfectly healthy eyes and nervous system, and B, a decided brunette with myopia, healthy (?) nervous system, and *congenital nystagmus*. *Of these twenty-three descendants two only (only daughter and one granddaughter), are brunettes. These are the subjects of marked congenital nystagmus; the others are healthy in all respects.* It is only on the assumption of an arrested or anomalous development of the oculo-motor, or co-ordinating centers, inherited from ancestor B in common with the dark hair, the dark eyes and the tendency to myopia, that one can explain such a striking array of facts. I am indebted to the courtesy of Dr. A. L. Cory, of this city, for an opportunity of studying the above cases.

²Vide Raehlmann's Cases 26 and 27, and several by A. Graefe, G. & S. Handbuch Bd. vi, i.

³Graefe's words (l. c. p. 229) are "ob auch ein eigentlicher nystagmus adnatus workommt, muss dahingestellt bleiben."

NOTE ON CONGENITAL NYSTAGMUS.

BY ADOLF ALT, M.D., ST. LOUIS, MO.

On June 21, 1882, I was consulted by J. G., M.D., then 33 years old, from a neighboring town, on account of nystagmus horizontalis and poor vision. There was congenital hypermetropia, the correction of which raised vision from $\frac{20}{L}$ to $\frac{20}{XXX}$.

When inquiring into the ætiology of the nystagmus the doctor gave me the following family data:

His grandparents were both myopic. They had five children, two boys and three girls. Of these the boys and one girl had nystagmus; the remaining girls' eyes seemed normal.

One of these two boys had, at the time of the examination, eight children, three of whom had nystagmus, five not.

The one daughter with nystagmus had three sons, all of whom had nystagmus.

One of the sons of this daughter had two children which were free from nystagmus.

Further details my case-book does not afford.

THE USE OF BICHLORIDE OF MERCURY IN THE TREATMENT OF OPHTHALMIA NEONATORUM.

Cohn (*Lehrbuch der Hygiene des Auges, erste Hälfte*, Wien, 1891), after an excellent chapter on the ocular inflammations of the newly born, exclaims somewhat as follows: "If the prophylactic rules which have been mentioned in the previous chapter were exercised in the case of all mothers and all newly-born children, it is quite certain that no eye would be lost on account of blennorrhœa, and that hygienic measures would deserve the thanks for these brilliant results; that in Europe every year there would be thirty thousand fewer blind people; that in the blind asylums one-third of the inmates would disappear; and that over one hundred thousand persons who, as a result of blennorrhœa, have sustained more or less damage to their visual acuity, would have full sharpness of sight. Truly a state of affairs worthy of the labor of the noblest!" This quotation, somewhat freely translated, is, perhaps, as forcible a statement as could be made in regard to the value of *prophylactic* measures.

But if prophylaxis fails, or if the disease develops because this has been neglected, a consideration of the *curative* procedures is of paramount importance. Probably no one at the present time will dispute the fact that the successful treatment of ophthalmia neonatorum depends upon (*a*) the reduction of the inflammatory swelling of the lids; (*b*) the cleansing of the conjunctival cul-de sac; (*c*) the use of a germicide which is free from deleterious effects upon the cornea; and (*d*) the instillation of those drugs which exert a favorable influence upon corneal ulceration, should this complication arise.

In a paper recently read before the County Medical Society

of Philadelphia, Dr. T. B. Schneideman advocated, among other remedies, the frequent irrigation of the conjunctival cul-de sac with a solution of bichloride of mercury, 1 to 2000, and reported excellent results. In almost every text book, and in almost every communication that has appeared upon this subject in recent times, and, indeed, in times that are no longer recent, sublimate solution, in some form or other, and in some strength or other, has been recommended. In the early days it was employed because clinical observation seemed to give it a distinct value. In recent times its use has been based largely upon belief in its strong germicidal properties. This is not alone based upon clinical observation. Even in the strength of 1 to 10,000 it is said to materially retard the vitality of the gonococcus. Experimenting upon the staphylococcus pyogenes aureus and the typhoid bacillus, Weeks found that their vitality was destroyed in exposures of ten seconds to bichloride of mercury, 1 to 500; in exposures of forty-five seconds to bichloride of mercury, 1 to 1000; and in exposures of ninety seconds to bichloride of mercury, 1 to 2000. Hence there is strong experimental evidence in favor of sublimate solution in the treatment of a disease which owes its virulence to a certain variety of bacteria. Further confirmatory evidence might be obtained from an analogous use to which this remedy is put by the genito-urinary surgeons, and its property of staying the discharge in specific urethritis—a disease depending upon the same micro-organism for its existence as ophthalmia neonatorum.

Unfortunately for the line of argument the conditions in ophthalmia neonatorum, or in purulent ophthalmia of the adults, usually called gonorrhœal ophthalmia, do not permit bichloride of mercury to exercise freely the germicidal value which experience and experimentation have abundantly shown that it possesses. In the first place, the gonococci of Neisser are contained within the living cells, and more than this; owing to their peculiar penetrating properties, they pass deeply within the conjunctiva and even into the lymph-spaces of the subconjunctival tissue. It is unlikely that sublimate solution

in ordinary strength, or in strength suited to the eyes, under these circumstances, can come in contact for a sufficiently long time to exercise a distinctly depressing effect upon the vitality of these cocci. More than this, it has been stated that bacteria in the presence of albumin have the power to reduce this substance to calomel, and thus materially lessen, if they do not destroy, its properties.

But for the moment admitting that these are minor considerations, and perhaps unproven, and granting the great value of clinical observations on these points, the most important objection to the use of this drug in strong solution (*c. g.*, 1 to 2000, or even 1 to 3000) is the unfavorable influence which it may exert upon the vitality of the cornea. It is well enough to employ a drug which kills the bacteria, but it will not do to employ one which does this at the expense of the life of the cornea. Recent investigations have shown that bichloride of mercury (1 to 5000) is able to produce parenchymatous keratitis even in a normal cornea, provided it is applied after this has been incised and the anterior chamber opened. Now, in ophthalmia neonatorum the resisting power of this membrane is materially lessened, and consequently its power to withstand the irritating influence of any drug is proportionately decreased. It is of the utmost importance to keep the epithelial covering intact, and thus prevent the formation of ulcers. It is possible that bichloride of mercury in strong solution is capable of injuring the surface of the cornea sufficiently to bring about an untoward result of this character, and as there seems to be some doubt (and probably well founded) that it exercises an efficient germicidal influence, under the existing circumstances, it is pertinent to inquire why it should be used at all, or if it is used, why should it not be employed in very weak solution, and simply with the hope of acting as a well-conditioned cleansing agent.

After all, if destruction of the gonococci is accomplished by any of the various remedies which are introduced into the conjunctival sac during this disease, it is probable that nitrate of silver (almost universally used) accomplishes this feat. It is

true that this, in spite of powerful germicidal properties, cannot pursue the gonococci into the subconjunctival tissue, but it destroys the superficial layer of epithelial cells in which some of them are contained, and in addition exercises a valuable astringent and alterative effect. Moreover, it can be applied to the diseased surfaces without coming in contact with the cornea.

In point of fact, getting rid of the secretion by irrigation, which for the most part must be intrusted to attendants, and which is a most important part of the treatment of this disease, is simply a preparation of the inflamed conjunctiva for a topical remedy which is believed to exercise more or less of a specific action. If the surgeon chooses he may employ bichloride of mercury for this purpose and apply it only to the conjunctiva, as is done in some clinics with good success, and not in the form of copious irrigations. Even boracic acid solution which is practically without germicidal value, and which is of very indifferent antiseptic properties, has the advantage of being a good cleanser and is slightly astringent; hence, if it is used with this idea in view, and not to the exclusion of nitrate of silver or some other remedy of like action, it has a useful place in the therapeutics of this disease.

It may be objected to the views which have been expressed in regard to the action of bichloride of mercury and its probable deleterious influence upon the cornea that the drug is used with brilliant results in the treatment of allied conditions—*e. g.*, granular lids; used, moreover, when the cornea is softened and even ulcerated. Under these circumstances, however, the discharge, if present, is less virulent, the cornea has become inured to the presence of irritating influences, the vitality of the membrane is not in an equivalent stage of depression, and irrigations and local applications are made with much less frequency, and consequently exert a less depressing influence.

The whole point of the matter, and the whole idea of this communication, is to enter a protest against the belief that the use of bichloride of mercury lessens the physician's responsi-

bility, because he has employed a drug which rejoices in a germicidal reputation. He must not rest satisfied with this. He may employ it, indeed, he should employ it (in the judgment of the writer, in weaker solutions than have sometimes been advocated), but he should not neglect other methods, because he has introduced, or caused to be introduced, into the conjunctival cul-de-sac a remedy the exact physiological action of which under these circumstances is not accurately determined; a remedy, moreover, in regard to which there is a good deal of evidence to show that it may act as a double-edged tool.

REPORT OF A CASE OF TOTAL BLINDNESS,
THE RESULT OF BRAIN TUMOR.—DIAG-
NOSIS VERIFIED BY THE AUTOPSY.¹

BY J. C. DENISE, M.D.,

Professor of Ophthalmology and Otology in the Omaha Medical College.

Under date of November 23d, 1891, Dr. J. J. Evans, of Norden, Neb., wrote me for advice, in regard to a young man under his observation, who was totally blind, and suffering intense pain in the temples and back part of the head and neck. December 3d the patient entered the Presbyterian Hospital, accompanied by his wife, a young, intelligent school teacher, from whom the following history was obtained, and kindly furnished me by Dr. Henry.

Patient had good parentage, and good habits, and never had any sickness, except at the age of 12 years he had inflammatory rheumatism in both knees. Recovery was complete after three months. No subsequent attack of late; he had worked

¹Reported to the Omaha Medical Society March 8, 1892.

a farm, but on account of hard times from drought and other causes, he came to Omaha last Winter and engaged with Swift & Co. to put up ice. While working in the ice-house he took cold, had headache, sore throat, pain in the temples and eyes, with profuse lachrymation. He was laid off from work only three days, when he was transferred to the oil room, and in a week's time considered himself as well as ever, with the exception of a slight pain in the temples, which has never left him. He continued to work, and about the last of March, when attempting to look at objects on the left, vision was obscured as though a scum was growing over the outer portion of the left eye, as he described it. In May while playing base ball he saw the ball double, rendering him a poor catcher. Vision in the left eye was now greatly impaired in all directions. In testing the eyes, separately, the vision of right eye was still good.

In August, the right eye began to fail just as the left had; that is, the right field was obscured. About the middle of October, the left eye became totally blind, and about a month later the right eye also became totally blind.

November 1st he fell from his pony, and it was thought he injured the back of his head, as he afterwards complained of more severe aching, and much stiffness in the back of the neck.

Dr. Evans, in his history, speaks of his cutting or sawing ice at the time that he noticed the vision failing, and attributed it to the bright light reflected from the ice. He suffered no pain then. The doctor further says that he suffered intense pain lately in the back of the head and in the temples, intensified at night. The pupils were enlarged, temperature normal most of the time, rising a little at night; pulse regular, about 70 per minute; bowels irregular, going three and four days without a stool; urine below normal in quantity, with large amount of albumen; feet were swollen some during the summer, swelling being worse in the morning.

Condition December 4, 1891, time of my first visit: I. H. Evans, æt. 19, married without issue, height 6 feet, weight 180 pounds, hair very black and thick over head, face, and body,

complexion dark, neck short and stout, nutrition apparently good, temperature normal, pulse slow, weak, irregular, afterwards quickening during the examination. Complains of headache over the forehead and back part, also of stiff neck and pain on turning the head. Requires extra clothing and artificial heat for comfort, is restless, will not sit still, and while lying down, tosses from side to side, rendering it difficult to keep him covered. Bowels constipated; urinates frequently, though in small quantity.

On examination of the eyes, the following was recorded. Conjunctivæ, scleræ and tension normal, both pupils dilated *ad maximum*. No perception of light by either eye.

Ophthalmoscopic examination with difficulty on account of the restlessness of the patient, but after several trials I was able to see the details of the fundus.

Left eye.—Media clear, optic disc red, its outline and margins barely discernable in limited section, arteria centralis and its branches diminished in size, veins tortuous. *Macula lutea* not observed.

Right eye.—Media clear optic disc very red, fuzzy; this condition extending beyond the optic nerve, and completely obliterating its margins.

Arteria centralis and branches somewhat attenuated, and veins tortuous and enlarged, two or more small, dark spots in the retina, as of hæmorrhagic origin. In fact we had the conditions known as *papillitis*—acute and progressive in the right retrogressive in the left, with atrophic degeneration.

No white spots, so characteristic of albuminuria, were discovered, though carefully looked for, on account of the previous history of albuminous urine. He denied syphilis to the last, nor were there any external conditions found to disprove his statement. On careful questioning of patient and wife, no discrasia was divulged among either his paternal or maternal ancestry.

The symptoms pointed clearly to an intra-cranial lesion, probably a tumor located somewhere in the region of the optic commissure and an unfavorable prognosis was given.

Dr. Henry, concurred in this opinion and subsequently Dr. Owen examined the patient, coming to the same conclusion.

The treatment consisted in excluding light from the eyes, regulating the bowels, remedies to give rest and sleep, and alterative absorbants. Morphine gave the best rest.

Ext. Jaborandi fl. was given every second night the first week, producing free perspiration and salivation. Considerable relief of head symptoms followed, and the soreness and stiffness of the neck disappeared. The nervous conditions also greatly abated.

After this, he was put on the biniodide of mercury 1-25 of a grain, three times a day, which produced its specific effect in about 48 hours, and was continued about a week, when the saturated solution of iodide of potash was substituted; commencing with 5 drops and increased till the daily allowance was 53 grains. Tonics were combined with this treatment all along, and liberal diet allowed, and all the disagreeable sensations were alleviated; pain subsided through the day, sleep was good through most of the night, and we began to entertain a faint hope that life might, at least, be prolonged, even through vision might not be restored, as there was no change in this respect. The pupils had been reduced in size by the use of eserine, but on its suspension, immediately expanded to their former abnormal size. Examinations of the urine were made several times, by Dr. Henry, the first within 24 hours after entering the hospital. In no instance was either albumen or sugar found; and with the exception of a large percentage of phosphates, it was in all respects normal.

About 6 p. m. of January 1, 1892, patient went into the bath room, just across the hall from his own quarters, and was found shortly afterward, prostrate on the floor in an apoplectic state. About three hours afterward he revived sufficiently to recognize a friend by his voice; got up on his hands and knees, turned himself in bed, and indicated by signs and groans intense pain in the head. He soon relapsed into a state of coma and general paralysis, remaining in that condition till death January 3.

At 5 p. m. of some day an autopsy was held, Drs. Henry and Owen kindly removing the calvarium, and rendering other valuable assistance. The venous vessels of the membranes were abnormally filled with dark blood. On lifting the anterior lobes, nothing unusual was observed, but on opening the fissure of Sylvius and lifting the middle lobes, a large effusion of blood was seen, partly fluid and partly clotted, and occupying, mostly, the left fossa, optic commissure and pituitary region. On carefully cleansing away this effusion, a foreign mass was found resting upon the commissure, and apparently involving the pituitary gland; this was removed in part, along with the chiasm and portions of each optic nerve, and subsequently sent to Dr. Hewitson for microscopic examination. The only other examination made was that of opening the ventricles. The third was partly filled with serum. The others were normal.

The following is an extract from Dr. Hewitson's report: "I find it to be a tumor, in size about that of an English walnut, grayish white in color, soft and spongy, and encapsulated by a thin fibrous envelope. On section, the center contains a cavity filled with cholesterine crystals and broken down fatty tissue.

"On microscopic examination, the tumor is found to be a "Glioma," which is undergoing sarcomatous and fatty degeneration. At several points beneath and around the capsule are found clots in various stages of organization." This report does not give the condition of the nerve substance, nor the relation of the tumor to its surroundings. I have verbal information, however, from the doctor, that the optic nerves were normal, that the commissure was infiltrated, and the tumor had its origin from the pituitary body, and was lying upon the commissure.

OBITUARY.

JOSEPH HASNER, RITTER VON ARTHA. +

After a prolonged illness Hofrath Professor, JOSEPH HASNER, Ritter von Artha died at Prague, February 22, 1892. He was one of the most prominent men of the old Austrian School of Medicine. He was born at Prague, August 13, 1819. After having finished his studies at the gymnasium he studied medicine and graduated in 1840 at the University of Prague. For two years he was "Secundaerarzt" in the general Hospital of Prague, and in 1842, he was given Arlt's position as assistant in the Eye Clinic of Fischer.

After Fischer's death, his place was given to Arlt, and Hasner was made "ordinirender Arzt" in the hospital, and a small ward for eye patients was entrusted to him. In 1852, he was made professor extraordinarius, and in 1856 professor ordinarius, when this position became vacant by Arlt's removal to Vienna.

Before the time when the law requires it, and when not quite 70 years old, in 1884 Hasner resigned the professorship, since in order to found the Czech University, his clinic was divided in two. This procedure offended him so much, that he demanded the immediate release from his duties.

Four years ago the first signs of the disease which carried him away became noticeable. With him one of the most prominent of the older representatives of Ophthalmology is gone. As teacher, as well as physician, he ranks among the best of his specialty. His literary work was far above the average. The following were the larger works from his pen: *Entwurf einer anatomischen Begründung der Augenheilkunde*

(1847), (sketch of an anatomical foundation for ophthalmology); *Physiologie und Pathologie des Thraenenableitungs—Apparates* (1850), (Physiology and Pathology of the Lachrymal Drainage Apparatus); *Klinische Vortraege der Augenheilkunde* (1860-66), (Clinical Lectures on Ophthalmology); *Beitraege zur Physiologie und Pathologie des Auges* (1873), (Contributions to the Physiology and Pathology of the Eye); *Die Grenzen der Accommodation* (1875), (The Limits of Accommodation); *Phakologische Studien* (1870), (Phakological Studies); *Das mittlere Auge in seinen physiologischen und pathologischen Beziehungen* (1879), (The Middle Part of the Eye in its Physiological and Pathological Connections); *Die Verletzungen des Auges in forensischer Hinsicht* (1880), (The Injuries to the Eye in their Medico-legal Aspect). Aside from these he wrote many articles for the journals of a medical and ophthalmological nature, the majority of which may be found in the "*Prager medicinischen Vierteljahrsschrift*," of which he was one of the editors.—*Archiv fuer Augenheilkunde*.

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

JUNE, 1892.

No. 6.

ORIGINAL ARTICLES.

THIRTEEN CASES OF PHTHEIRIASIS OF THE LIDS SEEN IN ONE YEAR.

BY FRANCIS M. CHISOLM, M.D.,

Surgeon to the Presbyterian Eye, Ear and Throat Charity Hospital of Baltimore
Maryland.

For the year 1891 there were recorded in the Books of the Presbyterian Eye, Ear and Throat Charity Hospital thirteen cases of crab lice infesting the eyelashes. The numerous entries of this rare form of disease excited comment, because so seldom found in the Eye Hospital Reports. Is it because we have more of it in Baltimore; or is it that a more careful examination is made of cases of apparent blepharitis which this condition so closely resembles? As the majority of these cases were in Polish Jews of recent importation such cases ought to appear much more frequently in European hospitals

than are reported. Hirschberg, in Berlin, is reported to have seen only three cases of pediculi of the lids out of 40,000 patients, and Galezowski, in Paris, but two cases in his enormous dispensary practice. Not a year has passed since the opening of the Presbyterian Hospital that one or more persons afflicted with this parasite have not applied for treatment.

Crab lice of the eyelashes, as animal parasites of other parts of the body, is an affection almost synonymous with filth and is found for the most part among the lowest class of humanity. Cleanliness and eyelash lice are yet not as wholly incompatible as we might suppose, if we are to judge from the appearance of a few of the patients. Well washed children, brought by parents neat in person, are occasionally seen among those seeking relief. On the other hand, the Negro race in whom pediculosis is well known to be excessively common, are seldom, if ever, troubled by insects locating in the lashes. The vermin found on the eyebrows and lashes are similar to those of pubis, both in size and shape, but according to Dr. Durkee their tint is somewhat lighter. The head or body louse, as we know, differs materially from these in form and color.

Some text-books mention such a disease of the eyes, but consider it an extremely rare condition. In others it is not described at all. From older literature we find that it either passed unrecognized as such, and was called by the general name blepharitis; or it was of exceedingly rare occurrence as evidenced by the scarcity of written records. Celsus, living about 1900 years ago, was the first to describe it; and since then to the present time not more than five or six instances have been reported in the experience of any one observer. Lawrence, in his "Diseases of the Eye" speaks of a child that came to his notice at the London Ophthalmic Infirmary complaining of itching eyes which he found on careful examination to be crab lice. The lashes, he says, looked thickened from the number of vermin clinging to each shaft. "I have seen this vermin on the eyelashes in one other instance only." Neither Demours nor his father had ever seen a case. Scarpa

reported one instance of ophthalmia from pediculi of the lashes. Arlt reports one instance of occurrence in his experience. Mackenzie on "Diseases of the Eye" quotes Lawrence's case, but says nothing of ever having himself seen the trouble. Stellwag refers to body lice as a very rare cause of blepharitis (which for many reasons is to be doubted) saying nothing, however, of the pubic variety. Prof. Michel goes more into a description and gives the appearance of the lashes and lid margin, differentiating between this and the other forms of blepharitis. Soelberg Wells mentions pediculosis ciliarum and says "that they might be mistaken for tinea but that the crusts are more circumscribed and are of beaded form." Landesberg contributes one case of pediculosis of the lashes and one of the eyebrows, occurring in a female child two years old. Leviste writes of a woman who was afflicted by the disease. Hansell gives the case of a two year old girl and her younger brother, whose lashes were infested with the insects and their "nits." The head of this child was also infected with its own peculiar variety. Hilgenberg wrote of a two year old boy affected with the trouble. Bader in his work "The Human Eye, etc.," gives a short description. Deval speaks of "pediculi ferox pubis" of the lashes, but his reference seems more to apply to maggots than to crab lice. Other cases (3) have been published by Rosenmeyer in which the disease had been mistaken for blepharitis and treated as such by the attending physician. Hooper reports a boy of ten years, a girl of two, and an Irish woman in whom there was also disease of the cornea, possibly as a coincidence and not as a result. Stelwagon has given another instance in a female child, and refers to Dr. Morton as having seen three cases in his practice and service at Will's Eye Hospital. In the clinic of Drs. de Schweinitz and Randall two more cases have recently been noted in female children; Dr. de Schweinitz having formerly reported one. Other instances might be spoken of, but these will suffice to show that pediculosis of the eyebrows and lashes was of exceedingly rare occurrence in the experience of writers and teachers of former times, as it seems now to be.

Those afflicted by this parasite are, as I have said, to be found chiefly among that class of society that pays least attention to its personal and surrounding cleanliness. Out of the 13 cases seen at the Presbyterian Hospital during the year 1891, 11 were of the Jewish race, and the largest number of these recently landed Poles. The remaining two were native Americans of American parentage. Nine were children under 10 years of age, 2 in their teens, 2 at 42 years and one at 52 years old. There were 7 females and 6 males. In nearly all the trouble was in the lashes of both eyes. In one case only were the brows invaded as well as the lashes.

CAUSE.—The disease is induced by direct contact only. One cause has been ascribed for the peculiarity in location, namely, that in young children there is not a favorable nidus for their development in the pubic region owing to the absence of hair and the accompanying sebaceous glands. In the lashes, on the contrary, glands are numerous and actively secreting. As this oil is their sustenance change in location becomes evident.

Plattheirus inguinalis or *pubis* is a minute insect, $1\frac{1}{2}$ mm in length by 1 mm in breadth; is oval and is covered by horny segments jointed together. Sharp spines project from the body in all directions. The head is in shape somewhat like that of a tortoise. Long antennæ project from it, and on either side are prominent eyes far back near the neck. Three legs, consisting of many joints and covered in the same way as the body, arise from either side. The attachment of these with the body is very thick giving to the animal the appearance of possessing great strength. The free end of each limb is provided with a sharp curved claw, by which they grasp the lashes and lid border very firmly and facilitates burrowing down deeply into the skin. The sharp claws give rise, at times, to excessive itching. The eggs or "nits" as they are called are fastened along the hair shaft 1 millimeter or so from its base. They are pear shaped, and about $\frac{1}{2}$ mm in length. The smaller end is attached to the shaft by a clear cement sub-

stance secreted by the parasite, while the larger end is provided with a cap or lid which the young insect pushes off and so makes an exit for itself. Yellowish white or light brown is the color of the insects, and that of the "nits" much darker brown; the cap being still darker than the rest of the egg. The movements of these animals suggest very much those of a crab, and as their shape is somewhat similar the common name of crab louse may have found its origin. The eggs hatch in six days and the young are capable of reproduction in 18 days (Durkee).

CLINICAL HISTORY.—The disease is usually seen after it has progressed weeks and months. Itching and inflamed lids are the complaint of the patients, although there may be no great irritation caused, and only the peculiar appearance of crusty lashes attracts the attention of the parents. Small bead like scales are seen fastened to the margin of the lids and to the hairs. Points of ulceration and rarely blood crusts may at times be visible. The lashes present a curious appearance of thickening and nodulation from the "nits" deposited along them. Among these and also on the lower lid can be found reddish specs, the excrement of the parasites. Two, three or more insects may be found on each lid lying imbedded usually in an inspissated secretion along the lid margin.

The important feature is their recognition, the treatment being simple. To a close observer who has seen a case of phthiriasis, the distinction between it with its peculiarities and the lumpy incrustations at the hair base which are produced in blepharitis is so marked that the diagnosis should be made at once. The nodular look of the eye lashes at some little distance from their bases is characteristic of the former. Once the diagnosis has been made the treatment is very simple and effective. The lashes may be trimmed off short and the lid border carefully touched with liquid carbolic acid, with tincture of iodine, or they may be well rubbed with a mercurial ointment. One thorough application of any of these remedies should destroy parasitic life and put an end to the trouble.

LITERATURE.

- Arlt.—Lehrb. d. Augenh., iii, 356.
Bader, Chas.—The human Eye, etc. London. 2867.
De Schweinitz and Randall.—Univ. Med. Mag., iv, 1891-2, 137.
Deval, Ch.—Traité d. Malad. d. Yeux. Paris. 1862.
Hansell, H. F.—Phil. Polyclinic, February 15, 1884.
Hilgenberg, C. A.—Organ. f. d. ges. Heilk. Aachen, 1854-5, p. 54.
Hirschberg.—Berlin. Klin. Wochens., xix, 1892.
Hooper.—Am. Jour. Med. Scienc, xxv, 1853, 374-6.
Landesberg, M.—Phil. Med. Bulletin, vol. iv, No. 6, 133.
Leviste.—Le Med. Moniteur d. l. policlin, 38, September 17, 1882.
Lawrence on the Eye. (Hays) Phil. 1847.
Mackenzie on the Eye. (Hewson) Phil. 1855.
Michel.—Handb. d. gesam. Augenh., vol. iv, 1876.
Rosenmeyer, L.—Münch. Med. Wochens., No. 9, 1886, March 2.
Scarpa.—Traité des Mal. des Yeux, 1821, vol. i, p. 266.
Stelwagen, H. W.—Arch. Dermat., July, 1881, Phil., p. 301.

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY, AMERICAN MEDICAL ASSOCIATION, JUNE 7, 8, 9, AND 10, 1892, DETROIT.

CHAIRMAN, DR. J. L. THOMPSON, OF INDIANAPOLIS; SECRETARY,
DR. GEO. E. DE SCHWEINITZ, OF PHILADELPHIA.

The Section on Ophthalmology convened at the Hotel Cadillac, Tuesday, June 6.

The Section was called to order at 3 P. M. by the Chairman, Dr. J. L. Thompson, of Indianapolis, who took as the title of his address,

HOW SHALL WE MAKE THE MEETINGS OF OUR SECTION MORE ATTRACTIVE AND HELPFUL?

He thought it was a mistake to have too many papers. Fewer papers should be read and more time allowed for the discussions which often enhanced the value of the papers read. He suggested the advisability of referring the matter to an executive committee to decide what papers should be read and discussed at the meeting and which should be read by title and referred to the publication committee.

THE GRADATION OF LENSES,

was the title of a paper read by Dr. Dudley S. Reynolds, of Louisville, Ky., in which he advocated the designation of lenses by their angles of refraction in degrees and minutes rather than by the inch or metric system as is the present custom.

WHAT MAY BE CONSIDERED NORMAL CORNEAL ASTIGMATISM?

By H. V. Würdemann, M.D., of Milwaukee.

The author considered the ophthalmometer an essential instrument for the specialist. It is generally held that the instrument gives nearly the total astigmatism of the eye. The author had not found this to be the case and thinks that the varying reports on the relation of the corneal to the total measurements may be accounted for by the personal equation of the operator and by this method of examination.

Instead of following the usual instructions for keratometry with the ophthalmometer of Javal and Schiötz by which an error of even 1 D. may be made, he advocates comparison of the black interspaces in approximating the plaques and reading off on the graduated scale of the arc the exact refraction of the principal meridians.

In the measurements of all sorts of corneæ in their principal and oblique meridians at 5° intervals from the visual center to the limbus, he finds all corneæ highly astigmatic in their periphery and that in most cases the curvature diminishes more rapidly in the vertical than in the horizontal meridians. He considers that five degrees on either side of the visual center serves for most purposes of vision and if this area be free from astigmatic aberration, the eye may be called non-astigmatic. The optical portion of the cornea however, embraces an area of about 170° around the pupillary center (which nearly corresponds with the optic axis). This is elliptoidal in shape, with axis approaching the vertical, being limited by the angular aperture of the pupil. This does not accord with the polar zone, which extends for 10° to 20° around the corneal axis. The latter zone is elliptoidal with long axis in direction of general astigmatic axis.

The amount and diameter of astigmatism is influenced by the relative position of the visual lines to the different parts of the polar zone. Degress of corneal astigmatism of 3. or 4. D may be produced by the visual line passing eccentrically

through the cornea, and in his opinion is one of the principal factors in its production.

From the records of 300 eyes of which 63 were emmetropic, 52 simple hyperopic, and 8 simple myopic, the rest showing total astigmatism, he finds 93% of the whole number to have corneal astigmatism appreciable by the ophthalmometer. All of the cases where the total equalled the corneal measurements, were found in the latter. All of the emmetropic, hyperopic and myopic eyes had corneal errors ranging from a little less than .25 D to 1.50 D. In adults the corneal astigmatism was usually .50 D greater than the total when the meridian of greatest refraction was vertical and the same amount less when horizontal. In old people the average difference was .25 D and in children .75 D. Most of the cases where the total equalled the corneal error were found in the elderly. This is a general statement as the amount of astigmatic aberration is modified by the kind of general ametropia and the amount of lenticular decentration. The difference is neutralized by a corresponding lenticular astigmatism *against the rule* which has its origin in the oblique position of the lenticular refracting surfaces to the visual line. The decrease in difference observed in old subjects may perhaps be explained by senile changes in the lens structure increasing its refraction. He considers that a total astigmatism is not fully corrected by cylindrical lenses on account of the irregular or meridional astigmatism which exists in all eyes within a few degrees of the visual axis. He regards that amount of corneal astigmatism as normal which is neutralized by the lenticular error. This irregularity in the corneal refraction may be considered a corrective effect on the part of nature in setting aside a certain amount of lenticular error. In the use of the ophthalmometer for glass-fitting he is generally prepared to subtract .50 D to .75 D from its readings when with the rule in children and to add the same against. In adults the difference is usually .25 to .50 D. When the meridian of greatest refraction is oblique the corneal and total error is about the same, and when at other angles a greater or less error is to be

expected according to the relative nearness of the principal meridian to the vertical or horizontal. When no central error exists, there is total astigmatism against the rule.

DR. HENRY D. NOYES, of New York, in the discussion that followed, dwelt upon the value of the Javal ophthalmometer in determining the amount of astigmatism. This instrument has shown that mixed astigmatism is more frequent than is commonly supposed. It has also shown that after the principle meridians of the cornea are not at right angles to each other. The determination of what the patient must wear, is however, a practical question and must be divided by the test case. The value of the ophthalmometer is that it determines the lines in which the experimentation must proceed. The use of the ophthalmometer has eliminated to a great extent the necessity for the use of a mydriatic. The mydriatic should be reserved for those cases in which it is required by the pain or other subjective phenomena. His plan in examining a case is first to use the ophthalmometer, then the ophthalmoscope with the glass determined by the ophthalmometer placed behind the mirror, and then he goes to the test lenses and ascertains what can be done toward bringing the acuity of vision up to normal.

DR. SAMUEL D. RISLEY, of Philadelphia, agreed with Dr. Noyes, that while the ophthalmometer was of value, the glasses to be ordered were those selected by the patient or giving the best acuity of vision, as regards the use of mydriatics; in his experience the use of a mydriatic was necessary in order to secure accuracy in estimating the error of refraction.

DR. G. C. SAVAGE, of Nashville, advocated the use of a mydriatic, saying that he was not willing to refract a case, especially in a young person without paralysis of the ciliary muscle. There is no harm in this measure.

DR. EUGENE SMITH, of Detroit, did not use a mydriatic as often as formerly. With the ophthalmometer, the retinoscope, and the ophthalmoscope, he found the necessity for mydriasis steadily diminishing.

DR. HUBBELL, of Buffalo, referred to one practical point in connection with the use of the ophthalmometer and that was

that the full amount of astigmatism as thus found should not be corrected, but a certain allowance should be made and the greater the amount of astigmatism shown, the greater should be the allowance.

METHOD OF EXAMINING THE EYES OF SCHOOL CHILDREN.

Under this title, Dr. B. Alex. Randall, (Philadelphia), touched upon the hygienic importance of such studies, the shortcomings of many of those heretofore made and the plan under which practically and scientifically valuable data would be obtained at the minimum cost of time. Distant vision and astigmatism are tested for each eye by a fixed artificial light; the muscle balance by Maddox prism, or red for a far point light, and for a near, dot-and-line or pen point; the punctum proximum of each eye for Jaeger No. 1; the refraction by the direct method, retinoscopy, and at need by test lenses; the color sense by Holmgren's worsteds; and these data together with notes of the general health any eye trouble, glasses, etc., can all be noted on a blank headed by the name, age, sex, school and class of the pupil and the date of the examination.

Recording these results himself, he was able in an examination of 356 boys in the William Pen charter school of Philadelphia, to examine about a dozen per hour and with a clinical clerk, an expert observer could easily make twenty such examinations in an hour, learning practically all ordinarily sought in the first examination of the careful specialist. Less than this generally leaves the finding to incomplete and uncertain to have value to science or to the individual, while as much more can be studied as time permits.

MANIFEST AND LATENT HYPEROPIA.

DR. EDWARD JACKSON, of Philadelphia, read a paper on this subject based on a statistical study of 214 cases, the refraction being accurately measured before and after full mydriasis. He found that the amount of hyperopia manifest depended largely on the method of testing for it, that contrary to the usual im-

pression it became more common rather than less common as the patient grew older, and that in those eyes in which there was some hyperopia latent, the proportion that was latent was about the same at different ages.

He concluded that latency of hyperopia is exceptional, inconstant, and abnormal; that it would usually be unnecessary to employ a mydriatic to render all the hyperopia manifest if we only had some method of certainty detecting the cases in which it was necessary. That a mydriatic is as frequently needed and as strong a mydriatic is needed to render manifest all the hyperopia at the age of forty-five as at fifteen.

In correcting hyperopia without a mydriatic the assumption should be that the total hyperopia is manifest. To add something to the correcting lens on the assumption that there remains a certain portion of the hyperopia latent will in the majority of cases entail imperfect distant vision which will last as long as the glasses are worn.

In prescribing the lens correcting less than the total hyperopia, in allowing for some of the hyperopia to remain latent we are allowing for an inconstant temporary condition, usually abnormal, and should warn the patient of the probable need for an early increase in the strength of the lenses; and that the best and most permanent relief result is not to be expected until such change has been made.

THE FOURTH DEGREE PRISM IN THE CORRECTION OF HYPERPHORIA.

By Dr. A. E. Prince, of Springfield, Ill.

The paper consisted of a selection of cases illustrating the importance of detecting and correcting minimum degrees of hyperphoria in cases of asthenopia, headache, neuralgia, drowsiness, dizziness, lachrymation, conjunctival hyperæmia, etc., in which no more apparent cause is found to account for the discomfort. The subject was illustrated by extracts from twelve cases selected to illustrate a variety of types of discomfort, in which the correction of so small an error has been found to counteract the symptoms.

The following matters of detail were urged to secure the greatest possible degree of precision.

First: Secure a perfect Maddox rod test which is thought to be superior to the prismatic displacement test for these delicate measurements.

1. Because the images on the retina are entirely dissimilar and have no tendency to blend.

2. From the fact that they can be superimposed thus facilitating comparison, which is especially important in the detection of small degrees of error.

3. Because comparison is more readily made between the hyperphoria and equivalent corresponding cataphoria, thus eliminating errors of observation or statement.

Avoid the effect due to the fact that these rods are drawn and a certain portion of them is slightly conical, which can be detected by inverting the rod before the normal eye. Have the rod mounted so as to rest in a frame independent of the face.

Still further to increase the efficiency of the method, at his suggestion F. A. Hardy & Co. have in process of manufacture, a phorometer, the essential portion of which consists of two 3° prisms, which rotate in opposite directions, over one another so as to present before the rod every fraction of a degree from 0, where they are neutralized to six degrees when they act together.

An arc is graduated to one-eighth of a degree, so that the refraction can be accurately read off, as well as the nature of the error whether it be exophoria, esophoria, or right or left hyperphoria.

Second: Make the point of observation the smallest compatible gas jet. By doing this a narrower light streak is observed which, when the rod is in the vertical position before the eye, should in the absence of hyperphoria, exactly cut the flame.

Third: Place the gas jet or taper before a dark back ground which will increase the capacity of the patient to detect a small error. On several occasions hyperphoria has been over-

looked, and other errors which were present corrected, later to find upon more careful observation with a reduced light and dark background, that one or two quarters were present, the correction of which gave relief.

Fourth: Compare the hyperphoria with the corresponding cataphoria, to which it should be equivalent. In event of discrepancy in these cases, it has been found the best practice to correct the smallest degree in the trial frames, and test again to ascertain if more becomes manifest.

Fifth: Following the suggestion of others it is believed that a much larger percentage of satisfaction can be secured by being provided with a variety of light steel frames, with bridges of various heights and prominence, supplied with long screws to facilitate changing of prisms, which should be worn for a sufficient length of time, either with or without such other corrections may be present, so ascertain whether the prism in question is acceptable to the patient.

Each case is a law upon itself, for some classes will be found in which the heterophoria is provisionally corrected with comfort to the patient, by the muscular adjustment, while in others an error of one-fourth degree will require a corresponding prism before relief can be obtained.

A word may not be amiss concerning the measurement of the weak prism, whereby the physician may be assured that his prescription has been accurately filled by the optician. There are various methods known to the mathematical optician which are impracticable in the practice of the physician, who must more than likely, rely on the method of neutralization. To this end, as well as in the original detection of the error, I have found the Maddox rod to serve best. Knowing the prismatic error possessed by ones' self, and having corrected it, the rod causes the ray of light to appear to cut the flame seen by the fellow eye. The glass in question is now held before the eyes, when an appreciable vertical displacement will occur. The neutralizing glass is now placed before the glass to be tested when the equilibrium will be restored. This method is simple and can be operated by any one having

good binocular vision, and an approximation to orthophoria.

FACIAL EXPRESSIONS AS INFLUENCED BY THE OCULAR
MUSCLES.

By George T. Stevens, M.D., New York.

In the course of some years of close observation of the anomalies of the muscles which govern the movements of the eyes, the fact that remarkable changes often follow the modification of these muscles led the author not only to regard with greater care these facial changes, but to bring to the subject the aid of photography. Photographic portraits of more than two thousand person have been taken, the records of whose ocular muscle conditions have been carefully and repeatedly made.

We have thus for the first time a series of observations in which the facial expressions are registered by photography, while painstaking determinations of the ocular muscle conditions are faithfully recorded. The result of the study has been to demonstrate that certain well defined types of facial expression are not only associated with but are dependent upon certain relative tensions of the oculo-motor muscles. With the state of equilibrium of the eye muscles, orthophoria, the expression is one of greater repose than with any of the states of heterophoria. The eyebrows form each a moderate and regular curve marking the border of the orbit, the lower border of the brow corresponding to the orbital border. The inner extremity descends toward the nose, but does not turn downward into the depression bounded by the nose and orbit. There is no sharp turn or curve at either extremity. The mouth is nearly horizontal, or curving very slightly upwards at the center. The lips, in repose, are firm, but not compressed and the upper one is well proportioned. The chin is rounded, neither square nor pointedly oval. The lines of the forehead are not especially conspicuous. The facial lines are moderately spreading. With esophoria, the brows are compressed, the extremities often curve suddenly downward, the inner extremity sinking into the depression bounded by the nose and

orbital border. The palpebral fissure is usually less widely open than in orthophoria or exophoria. The lips are firm, the upper one short. The posterior portions of the alae of the nose are drawn slightly upward. The superficial lines or grooves upward from the nose are erect and distinct especially in middle life and later; transverse lines upon the forehead, low; the naso-labial and cantho-malar grooves spreading. The lower part of the face is broad.

With exophoria the brows are usually raised, often strongly arched; palpebral fissure often wide, upper lid rather conspicuous; upper lip long; corners of the mouth often drawn up, and the mouth curving down at center; lower part of the face usually narrow; principle grooves of the face more vertical than with esophoria. The transverse lines upon the forehead are mostly above the center.

Hyperphoria is characterized by irregular features. On the side the visual line of which tends to rise above the other, the brow is depressed, while on the other side, the brow is elevated. Thus the brow and neighboring tissues of one side aid in depressing the front of the eye, while on the other hand, by the elevation of the opposite brow, less demand is made upon the muscle which rotates that eye upward. These contrary actions demanded by the relations of the visual lines in hyperphoria affect the whole face, resulting in a want of harmony of the two sides. The angle of the mouth on the side on which the brow is depressed is drawn upward. Thus one side of the face appears longer than the other.

There are a number of sub-types, depending upon hyperesophoria and hyperexophoria.

While there were apparent exceptions to these rules—as to most rules—and while the bony structure must give to the face its general form, the law is very generally prevalent.

The recognition of these types of expression is useful to the oculist as well as to the artist, any one of the types may be modified or transformed to another type by modifications of the relative tensions of the muscles which rotate the eyes.

[TO BE CONTINUED].

SELECTIONS.

SOME CASES OF OBSTRUCTIVE DISEASE OF THE LACHRYMAL PASSAGES AND THE ASSOCIATED INTRANASAL LESIONS.¹

BY G. E. DE SCHWEINITZ, M.D.,

Professor of Ophthalmology in the Philadelphia Polyclinic; Lecturer on Medical
Ophthalmoscopy, University of Pennsylvania; Ophthalmic Surgeon to
the Philadelphia Hospital, etc.

The intimate relationship between diseases of the lachrymal apparatus, that is, of the drainage system of the eye, and various types of the inflammatory changes in the nasal mucous membrane, is an old story. Indeed, the close association of ocular and naso-pharyngeal disease is not limited to these conditions. The great majority of phlyctenular ophthalmias depend upon some type of rhinitis, and are often the direct outcome of adenoid growths in the pharynx. Many obscure symptoms, which we are wont to describe under the general term "asthenopia," have been known to depend upon intranasal disease, and a variety of orbital, ocular and post-ocular pains are frequently "referred pains," that is, their origin is from some lesion within the nasal cavity, the frontal sinus, ethmoid cells, or antrum of Highmore. In fact, as Harrison Allen has remarked, a good deal of the success of treatment depends upon a proper attention "to the commonality of the various parts of the cephalic mucous membrane."

¹Read before the the Philadelphia Medical Society, April 1892.

The following cases are reported, not because they illustrate new points, but because they emphasize some old ones, and still more because they emphasize that the cure of obstructive lachrymal disease is materially facilitated, not merely by the ordinary measures adopted for rendering the passages patent, in association with what may be called routine intranasal treatment (for I take it no one attempts to treat lachrymal disease without due attention to the nasal mucous membrane), but that more radical measures are frequently of value when applied to the nasal chambers and the vault of the pharynx, which in the majority of cases are the regions primarily affected.

CASE I—*Purulent Dacryocystitis; Traces of Rhinitis and Abnormal Shape of the Lower Turbinate Bone.*—D. D., a boy, aged 6, reported for treatment, November 3, 1890. Three years ago pus began to exude from the right punctum lachrymale, and in spite of treatment this condition has continued ever since. The boy was healthy in other respects; he had never suffered from measles or scarlet fever; was free from evidences of inherited syphilis, and had sustained no injury. His voice was slightly nasal in tone.

The lower canaliculus was slit, and a firm stricture at the beginning of the nasal duct was evident. The probe was not forced, neither was the stricture incised.

The patient was referred to Dr. Alexander MacCoy, for nasal examination, who reported as follows: "The right nostril shows an abnormal shape of the lower turbinate bone, also some evidence of a severe rhinitis during the past. I believe that the position and form of the lower turbinate body have had much to do with the disease of the duct on account of the obstruction to its entrance at its lower portion into the nasal chamber. The boy also has a pharyngeal tonsil which obstructs the posterior nares somewhat." Dr. MacCoy undertook the treatment of the nasal condition, and after a few days the stricture was incised, the probe passed, and the usual treatment instituted. When the intranasal obstruction was removed, the epiphora ceased and has never reappeared.

I have referred to this case in a paper on the use of pyoktanin in dycryocystitis,² and may repeat that my colleague, Dr. Gould, as well as myself, has obtained satisfactory results with this drug in the treatment of unhealthy lachrymal secretions.

The case is now utilized, however, to illustrate what seems to me a very important point to which Dr. MacCoy calls attention in his report, namely, that although the stricture of the duct, which in this case existed high up, was penetrated, and although the fluids and the probe passed readily, the epiphora continued because of the malposition of the turbinated bone. Indeed, this obstruction sometimes exists only in the form of a small flap of mucous membrane, which closes the entrance of the duct into the inferior meatus, very much as a valve would do. This effectually prevents the drainage of the eye, and unless it is removed, good results will not follow. In this particular instance it was very easy to see the obstruction by first passing a probe and then exposing the entrance of the duct into the meatus by means of a nasal speculum—a slight precaution which will often lead to the discovery of a cause of a persistent overflow of tears in spite of the apparent permeability of the passages.

CASE II.—*Catarrhal Dacrocystitis; Bands of Adhesion from the Inferior Turbinated Body to the Septum*.—Ella H. aged 28, reported for treatment at the Philadelphia Polyclinic, October 24, 1891, on account of an inflammation of the right eye, which had existed for several days. There was a small abscess at the inner margin of the lower lid, with a fistulous communication into the lachrymal sac. A free muco-purulent secretion distended the sac in the form of an ordinary mucocele. The canaliculus had been slit at some previous time, but a probe did not pass readily.

She was referred to the throat department, and examined by Drs. Authur Wilson and Walter Freeman, who reported as follows: "Atrophy of both inferior turbinates; unable to ob-

¹University Medical Magazine, vol. 3, p. 181.

tain a posterior view; former ulceration of the posterior wall of the pharynx; bands of adhesion from the inferior turbinates to the septum; also one from the middle turbinate to the septum on the right side."

Even in the absence of definite history, the pharyngeal condition seem to indicate syphilis. The patient was ordered an astringent lotion, given potassium iodide and bichloride of mercury, and referred to the throat department for treatment. In January of this year an operation was made upon the lower turbinated bone, and the condition has improved without passage of probes, the secretion and the epiphora have materially lessened.

This case illustrates the ordinary intranasal lesions, which were evidently at the bottom of lachrymal trouble, and is further interesting, because these lesions gave confirmatory evidence of the syphilitic condition, so much so that improvement was facilitated by the proper constitutional remedies.

CASE III.—*Lachrymal Abscess; Spur on the Septum opposite the Middle Turbinated Bone; Chronic Pharyngitis.*—Sarah S., aged 45, reported for treatment at the Philadelphia Polyclinic, November 24, 1891. In April, 1891, epiphora began in the left eye, for which she seems to have undergone no treatment. It continued until about one week ago, when suppuration of the lachrymal sac took place. When she presented herself there was a very marked lachrymal abscess. The pus was evacuated by an external incision, the sac freely irrigated with an antiseptic fluid, and the patient referred to Drs. Watson and Freeman for examination.

They reported as follows: "On the left side there was a spur on the septum, opposite the middle turbinated bone; also hypertrophy of the tissues. The turbinates are small. There is chronic pharyngitis, a thick phlegm covering the tissues."

Unfortunately this patient has failed to report with any regularity, and the ultimate result cannot be given. The case illustrates the history of so many of these cases, namely, a chronic pharyngitis and hypertrophy and inflammation of the intranasal mucous membrane, involvement of the lachrymo-

nasal duct, and epiphora owing to an obstruction primarily from swelling of the mucous membrane, and later from the formation of a positive stricture. Under the influence of the pressure and of the stricture, the fluids of the conjunctival sac are not drained, but distending the lachrymal sac, become infective, an abscess forms, and the condition which has been described results.

CASE IV.—*Epiphora; Atrophic Catarrh*.—Jane C., aged 60, reported for treatment at the Philadelphia Polyclinic, November 14, 1891, complaining of pain in her eyes, constant epiphora and inability to read on this account. There were considerable hypermetropia and some astigmatism and, as epiphora is frequently caused by the strain of uncorrected ametropia, proper glasses were ordered, but the overflow of tears continued. Both canaliculi were then slit. There was narrowing of the ducts, but no stricture, and probe and fluids passed readily. The epiphora improved, but did not disappear.

She was referred to the throat department, and the following report was made: "There was an atrophic condition on both sides, and a spur on the septum on the right side, near the opening of the lachrymal duct, but it does not interfere. The closure is probably due to contraction from atrophic changes.

This is a very good example of a very common condition, most frequent in elderly people, where there is neither disease of the sac, stricture of the duct, nor pressure from a spur or hypertrophy of the turbinated bodies, but where the obstruction depends upon contraction from atrophic changes.

CASE V.—*Phlegmonous Dacrocystitis; Deflection of the Septum; Spur on the Left side Pressing on Inferior Turbinated Bone*.—Matthew L., aged 27, presented himself for treatment on account of an extensive lachrymal abscess, with a small opening and widespread infiltration of the tissues, producing a large swelling, involving the lower lid and cheek. The abscess was incised, and the pus cavity freely washed out and an antiseptic dressing applied. In a day or two the swelling had

subsided, and nothing remained but a slight brawniness of the tissues and a fistulous opening at the point of incision. The canaliculus was slit, but all efforts to introduce the probe proved futile. The patient had been much exposed to weather; had a history of an old injury; but denied syphilis. The obstruction to the tear passage had existed since early fall.

He was referred to the throat department, and the following report was received. "The septum is irregularly deviated in front; there is a spur on the left side pressing on the inferior turbinated body, which also contains an ulcer in its anterior portion."

He was warned that "catching cold," which would increase the nasal obstruction, would certainly bring about a relapse of the abscess. He went to work, however, and returned a few days afterwards with all the conditions previously described in a very much aggravated state. The same treatment was instituted, and he was again referred to the throat department, and on February 23, the hypertrophy on the left side was removed. On the same day a probe was passed, and since this time its passage has been repeated. Epiphora still continues, but is decreasing day by day.

This case illustrates the mechanism of relapse in many of the tear-passage cases, in this instance producing a very serious phlegmonous inflammation. Under treatment and rest sufficient drainage takes place to produce amelioration of the symptoms; swelling from congestion, owing to exposure, is added to the organic obstruction already present, producing complete closure with an exacerbation such as has been detailed.

CASE VI.—*Stricture of the Nasal Duct; Moderate Hypertrophy of the Inferior Turbinated on the Left Side and a Spur on the Right Side.*—Ridget R., aged 50, applied for treatment to the throat department of the Philadelphia Polyclinic, and the following lesions were found: "A moderate amount of hypertrophy of the left inferior turbinated near the nasal duct, and a spur on the septum of the right side, close to the opening of the duct. With these lesions there was epiphora, most

marked in O. D., and slight lachrymal conjunctivitis. She had not been able for a number of months to use her eyes with any comfort. She was referred by Drs. Watson and Freeman to the eye department. The canaliculi were slit, and a stricture was found at the mouth of each sac. A No. 2 Bowman's probe was passed without difficulty.

It is evident that although there were lesions in the nasal passages, they were not obstructing the duct; but under the influence of the chronic nasal inflammation a stricture had formed in the lachrymal canal.

CASE VII.—*Epiphora from Swelling of the Mucous Membrane of the Lachrymo-nasal Duct. Atrophic Rhinitis.*—A. K., an unmarried woman, aged 26, was referred to me by Dr. Ralph W. Seiss, on account of epiphora of the right eye, which had persisted for some time, in spite of nasal treatment. There was no swelling of the lachrymal sac, no catarrhal or purulent secretion, but simply an overflow of tears. The general health was good, the eyes not far from emmetropic, and there was neither asthenopia nor headache.

Dr. Seiss has kindly furnished the following report of the nasal lesion: "Atrophic rhinitis, presenting the ordinary appearance of tissue destruction, combined with some odor and much secondary laryngo-bronchitis."

The canaliculus was slit, and a No. 3 Bowman's probe was passed without meeting a stricture, but with a resistance to its passage which is characteristic of obstruction from swelling of the mucous membrane. After the passage of this probe the duct was irrigated on several successive days with a solution of boracic acid and common salt, without, however, passing the canula into the duct. The fluid trickled readily through the nose. The epiphora stopped after a few treatments, and has never returned, although many months have gone by since she originally reported.

This patient represents a common class of cases of epiphora associated with chronic inflammation of the naso-pharynx. An inflammation occurs in the nasal duct, but does not produce a true stricture; the occlusion is from swelling, not

from cicatricial changes. In many cases it is sufficient to do waht was performed in this case; in others even milder measures suffice. Above all things, this is an example of a class of cases, the successful treatment of which I have learned, especially from Dr. Risley, by obeying the principle which he was wont to instill, not to be too ready to pass probes and canulas, lest their introduction scrape away some of the mucous membrane and really do more harm than good. It is unnecessary to do more than medicate the swollen mucous membrane with any solution that is suitable. I prefer boracic acid and common salt.

Many more cases might be quoted; but these seven, representative of various classes, are sufficient to illustrate the points which I desire to make.

(1) A large class of cases exists, characterized chiefly by epiphora, without catarrhal or purulent secretion, in which obstruction in the lachrymo-nasal duct depends upon swelling of its mucous membrane, and not upon true stricture. The primary origin of these cases, in the great majority of instances, is a chronic or subacute post-nasal catarrh. The evident indication is the treatment of the latter condition and the medication of the swollen mucous membrane of the lachrymo-nasal duct, so that it may regain, as nearly as possible, its natural condition, which it will do without much instrumental interference—an interference that may of itself, if unskillfully performed, be the cause of a cicatrizing band that never originally existed. Case VII of the series illustrates this class of cases.

(2) The life-history, if I may so express myself, of many cases of obstructive disease of the lachrymo-nasal duct and the formation of a lachrymal abscess, is illustrated by cases III and VI. First, a chronic pharyngitis occurs; later, hypertrophy and inflammation of the intranasal mucous membrane, followed by swelling of the lining tissue of the lachrymal duct. Gradually cicatricial changes arise, and a true stricture is formed. The drainage of the conjunctival cul-de-sac ceases; the micrococci natural to the part, and those which readily

find access to this region, permeate the contents of the lachrymal sac, because this can no longer be emptied; the pathogenic micro-organisms exercise their true function, and suppuration occurs.

(3) A number of cases develop, chiefly in old people, in which there is epiphora, again without the presence of pus or muco-pus, depending upon obstruction in the lachrymal duct from atrophic changes, the whole being part of a similar atrophic process in the intranasal passages, and generally described under the term "atrophic catarrh." The obstruction in these instances is not from swelling, not from stricture, but from contraction. Case IV of the series is an example in point.

(4) A very common cause of exacerbation of lachrymal disease is due to the pressure of a hypertrophic turbinated body, or similar intranasal obstruction, which under treatment has gradually subsided, but which, owing to exposure, swells up again and exercises its obstructing influence. At once there is occlusion of the lachrymal passages with recrudescence of the symptoms. The very serious nature of such cases is illustrated in Case V of the series.

(5) In every case of lachrymal disease the physician should be mindful of constitutional causes, and the value of confirmatory evidence by pharyngeal and intranasal examinations is illustrated in Case II, an example of constitutional syphilis. Local treatment may be necessary; local treatment without general medication is ineffectual.

(6) Finally, I come to the class of cases in which there exists an obstruction at the intranasal end of the duct (it may be trivial), permeable by the fluids used in a syringe, but an impassable barrier to the outflow of tears. Even the slightest obstructions, under these circumstances, may defeat the most classical treatment of lachrymal disease. The ready detection of such a lesion is illustrated in Case I of the series.

It has not been my intention at present to refer to what are the best means of treating lachrymal disease, except in so far as these are implied by the descriptions of the lesions which existed in the examples I have reported. Whether we believe

that small or large probes should be passed, whether we class ourselves with those who believe that the probes should not be used at all, whether we are the advocates of this or that antiseptic and astringent fluid, whether we think that strictures should be incised or should not be incised, whether we believe in the permanent wearing of styles or canulas, it is evident that the rational treatment of certain types of obstructive lachrymo nasal disease must also include, not only the ordinary intranasal treatment with sprays and powders, but a systematic and thorough examination of the naso-pharynx. and, if necessary, the best operative interference known to intranasal surgery. (*Univ. Med. Mag.*)

A SIMPLE METHOD OF TREATING MANY CASES OF LACHRYMAL OBSTRUCTION.

BY GEORGE M. GOULD, A.M., M.D.,

Ophthalmologist to the Philadelphia Hospital.

I always suspect that system of therapeutics, whether political, social, or medical, to be wrong that proceeds on the assumption that its author could have given God some very good advice had the reformer been present at the creation of the world. In social science it is well recognized that any method of enduring progress must be based on helping Nature instead of disregarding or opposing her. In medicine and surgery the history of all failures is that "the fools rush in" with their little wisdom, supposed superior to the great wisdom of Nature, and, without study of the subtle ways and indications of the physiological processes, ruthlessly disturb or overturn the delicate measurss of cure silently at work.

There seems to me a little illustration of this great truth in one small department of ophthalmic surgery—that relating to the condition of the lachrymal excretory apparatus giving evidence of itself by lachrymal retention, or even epiphora, lachrymal

conjunctivitis, dacryocystitis, etc. There are, of course, a few cases in which the patency of the system is interrupted by closure of the intranasal orifice of the duct, the result of rhinitis, chronic or acute, malformation of the adjacent parts, indiscriminate use of the cautery, of the lachrymal probe, etc. There are others in which a genuine anatomical stricture may exist, the result of inflammation, morbid growth, traumatism with probes, etc. Without attempting an enumeration of such cases of lachrymal stenosis or occlusion, and admitting them out of this count, I wish to urge that the vast majority of cases with symptoms of retention of tears are due to temporary and functional causes. There is a large number due to excess of secretion (instead of defective excretion) arising from eye-strain (overuse of a physiologically normal or an ametropically abnormal eye), from local irritations or congestions of many kinds, etc. There is another and still larger class of cases in which the abnormal conditions of the nares or nasopharynx by contiguity of tissue, or by duct-transfer of morbid material, living or chemical, to the upper part of the duct or sac, there set up congestion of the lining mucous membrane, and hence stenosis and retained secretions. It needs only the very slightest swelling of the membrane to narrow overmuch or to entirely close the patency of the tiny lumen of the canaliculus or duct.

Dr. S. D. Risley tells me that in examination of a number of dry skulls he found in none lachrymal ducts which admitted of the passage of the larger probes advised for "probing" the living, membrane-lined, and therefore narrowed, canal. The careful and excellent observer has long taught that the function of the duct is not that of a large drain, which it is not, but of a tiny capillary tube, which it is. The frequency of unhealthy nares, the abundance of dust and other pathogenic material, living or neutral, in our modern city life, that is sucked through the nares with every breath, or deposited in the conjunctiva between every wink of the eyes, furnish evident reasons for the overstimulation of the lachrymal or secretory apparatus, or for the functional interference of all grades with

the act of excretion. A little narrowing, the irritation of a little retained morbid material, the extension up from the nose or down from the conjunctiva of a frequently-present local congestion or inflammation—and we have the eye bathed in tears, lachrymal conjunctivitis, or dacryocystitis.

Under such circumstances, what anatomic ignorance, what physiological stupidity, what therapeutic sin, to “slit up the canaliculus”—that wonderful little structure, with its sphincters about the puncta, and fashioned so patiently by Nature for a purpose and use—forever destroying its function, and, by brute force, jamming a rod of metal down among the congested membrane, wounding it in every part of its length by crushing it between the rigid probe and the bone, against which it lies in such close union! And yet this is the routine practice advised and carried out almost everywhere.

No wonder such cases are “obstinate.” The cure creates the disease, and even worse; where before was only functional stenosis, there is doubtless often, by traumatism, organic stricture following inflammation set up by the probe injury.

Let us go at Nature less mechanically and brutally. Is there not a better way?

About a year ago I found blue pyoctanin (1 to 1,000) an excellent means of overcoming lachrymal conjunctivitis and disorders of the sac and duct, and I believe my colleague, Dr. De Schweinitz, substantially agrees with me in conclusions from the experience. The effect is doubtless due to the powerful penetrating quality of the methyl violet, coupled with some antiseptic property. But it is almost impossible to use this drug without its highly objectionable staining qualities becoming obtrusively manifest. I have therefore discontinued its use and have adopted another plan that seems to me based upon natural methods and to be an extension of Nature’s indications.

Little children, in whom the fount of tears easily overflows, and in whom the excretory function is therefore put to most active use, are constantly “gouging” the “corners of their eyes,” the inner canthi, with their little fists in a way that sometimes

appears almost dangerous. Here, then, is the latest discovery in therapeutics—massage made use of by infantile wisdom. Even therapeutically, "babes and sucklings" may teach us if we are modest enough to learn.

In dacryocystic troubles every ophthalmic surgeon empties the sac by slow pressure upward and inward toward the inner canthus. How frequently in doing this we force a gush, seemingly absurdly great in quantity, of watery, mucoid, or purulent material, through the puncta—especially the upper one! But not following up the hint given by the babies, or by this latter procedure, the surgeon stops here and reaches for the knife and probes.

It would seem that the suggestion of massage, of continued and repeated emptying of the clogged sac by pressure, were worth trying. Perhaps massage alone would cure many cases. If now, without injury to the parts, we could refill these empty but congested canals with an antiseptic and astringent fluid, would we not at once and certainly cleanse, heal, and bring all back to physiological order? This is very easy.

First empty the sac and canaliculi by dexterous pressure, and cleanse the eye and palpebral pockets of this unhealthy material. Then cant the patient's head back and to one side, or have him lie so that a teaspoonful of liquid will be held in the depression formed by the nose, orbital border, and superior maxilla. Fill this space with a solution of boric acid,¹ and with the little finger again slowly empty the sac and canaliculi by pressure, and then, as slowly lessening the pressure, allow these spaces to refill, by suction and capillary attraction, with the solution under which the puncta are submerged. Again, in half a minute empty the canaliculi and sac by pressure, but this time beginning the pressure from the canthus toward the nose and downward, so as to force the antiseptic solution downward, so as to force the antiseptic solution downward into the duct. These alternate emptyings and refillings of the

¹The solution I use is composed, to the ounce of distilled water, of boric acid, ten grains; common salt, three grains; chloride of zinc, one grain—all deeply tinted with pyocyanin-blue, and doubly filtered after long standing.

sac may be repeated several times and as often as desirable to meet the indications of the case. It will usually be found that the sac will soon become healthy and that pressure upon it will not cause regurgitation of morbid material through the puncta.

This treatment may not be "surgical," but it is "common sense."

A certain number of cases, however, will not yield to this treatment. There is too great a stenosis or spasmodic contraction of the muscular sphincter of the punctum, etc., so that the cleansing solution can not be forced into the sac and duct. In such cases I am accustomed to insert one sharp point of the iris scissors into the punctum and snip it open about one-eighth of an inch, perpendicularly downward toward the conjunctival fold. This gives a larger opening for the indrawal of the solution.

I have been astonished to see how rapidly cases recover under this simple treatment that formerly would have seemed to demand slitting of the canaliculus and probing. I have been led to wonder if under the old treatment the good was not really done by the antiseptic or cleansing solutions commonly used with the surgical treatment—and, indeed, if the collyrium did not effect the cure in spite of the probing. I am thoroughly convinced that the very free use of antiseptic eye lotions, by the constant passage of the same through the duct, act therapeutically on nasal inflammations, that are themselves the primary causes or sources of conjunctival affections. Of course, a more effective treatment would be that of the nares direct.

One of the chief advantages of this simple procedure I would urge as consisting in the ability of the patient or of the patient's friends to carry on the treatment at home after a brief explanation and illustration by the physician. I am aware that some would consider this a disadvantage. Another and more important point in its favor is that general and family physicians can carry it out with the greatest ease. These, generally speaking, have not the necessary skill, or the special instru-

ments for probing, etc., or they shrink from "interfering with the eye;" hence many patients, failing to seek the specialist's services, remain untreated and go on from bad to worse. A large proportion of such cases would find speedy relief by an application of the foregoing method.²—*N. Y. Med. Jour.*

²Being able to subscribe to all the points made in this paper from my own experience, it is reproduced with recommendation. Alt.

OPERATION ON MICROPHthalmic EYES.

H. Lindo (*The Ophthalmic Review*, February, 1892), in an interesting paper on microphthalmic eyes, describes some results which he has had in improving the vision under such circumstances.

In one case, a woman aged 42, the vision of the left eye had been lost on account of glaucoma, in spite of successful iridectomy. The vision of the right eye was fingers at four meters, and she was wearing a convex lens of 5 D, with which she could decipher words of J. 8 at about three inches from the eye. The tension was normal. The optic disk seemed to be natural, but intensely red. The refraction is stated to have been +27 D, and with this lens she could count fingers at 6 metres, but was not able to bear a lens stronger than +14 D, because of the intense dazzling. About two years later this glass was strengthened to 18 D. The patient was quite comfortable with this. She could see $\frac{6}{1X}$ and read words at J. 1 at three and one-half inches. The reporter hopes that he may be able to give a still more ample correction later on, and lessen the danger to strain of accommodation and the production of glaucoma. The corneal measurements were as follows: The horizontal measurement was 10 millimetres in each eye, while the vertical axis of the cornea was about 5 millimetre less.

The second case was a child in whom shortly after its birth it was noticed that the eyes were small and defective. When two years old it was found that the irides were firmly bound

by adhesions to opaque lenses. Atropine treatment failed. When Fergusson saw the case, in November, 1885, the pupils were only pin-hole and the margins of the iris attached firmly to the opaque lenses. Sight equalled the power to follow the flame of a candle. In January of the following year, as nystagmus had considerably increased, an iridectomy inward was attempted on the left eye, but succeeded only in tearing away a small portion of the iris tissue. An anterior synechia formed at the sight of the incision. Two weeks later an iridectomy was made outward and the synechia was cut. He also did an iridectomy on the right eye up to the cornea. The left eye healed with an anterior synechia at the site of the incision, but in the right eye a clean iridectomy was obtained. Nystagmus was considerably lessened by the operation. In January, 1891, with the right eye, the patient counted fingers at .6 metre; with the left eye, fingers at .75 metre. The cataract of the right eye was then needled. There was no reaction, the opacity was chiefly capsular, and by the 5th of the following month, fingers could be counted at 1.75 metres. On February 9, the remains of the capsule were removed through a small corneal incision. On the 26th, vision equalled fingers at 3 metres, improved by the use of a 10 D lens. The optic nerve was now visible, and was much atrophied. On March 3, the capsule of the left eye was cut with De Wecker's scissors, and by March 20, with +13 D, vision equalled fingers at 2.25 metres. The nystagmus has now ceased and the horizontal diameter of the cornea was just a shade under 9 millimetres. It was extremely difficult in this case to test the vision; but three months later, while the child was wearing the convex 13, the father reported that a great improvement had taken place in her sight, that she was able to discern objects that had never been noted before.

Mr. Ferguson reports these cases in the hope that they may bring out experience of other ophthalmic surgeons. He refers to two interesting points—the occurrence of glaucoma in an eye with a 10-millimetre cornea, and the fact that defective development of an eye does not prevent its being successfully operated upon if the necessity arises.—*Ther. Gazette.*

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

JULY, 1892.

No. 7.

ORIGINAL ARTICLES.

UNUSUAL CASE OF SYMPATHETIC BLINDNESS.

BY G. STERLING RYERSON, M.D., C.M., F.R.C.S., EDIN.,

Professor of Ophthalmology and Otology in Trinity Medical College, Toronto.

In October, 1891, Wm. W., æt. 28, was sent to me suffering from tumor of the right orbit. He stated that the growth had made its appearance in the spring of the same year, that it caused, at first, little or no pain, and that beyond the protrusion of the eyeball and dimness of sight, he felt little inconvenience. Three weeks before presenting himself, he noticed that the sight of the left eye was beginning to fail, and that he had considerable pain in the head. On examination the following condition was observed: Right eye—Eyeball pushed directly forward, pupil dilated and immobile. Eyelids distended and tense. On right temple a boggy swelling of considerable size was observable. Digital examination fails to reveal a tumor, and, except for swelling of the lids and temple, the result is negative. Left eye—pupil dilated, reacts some-

what to light. No protrusion. Movements normal. Vision= shadows. Ophthalmoscopic examination; in left eye well marked optic neuritis was present. Swollen disc, dilated vessels and minute hemorrhages were to be seen. In right eye—well marked optic atrophy. I could not determine with certainty if it was the sequel of neuritis or not. My diagnosis was sympathetic neuritis due to pressure by a tumor of the optic nerve. The following day I proceeded to eviscerate the right orbit. After removing the eyeball and introducing my finger I could feel a tumor the size of a horse-chestnut at the apex of the orbit. I proceeded to remove it and other contents of the orbit. It had the macroscopic appearance of a sarcoma when removed. The patient recovered from the first effects of the operation well, but upon making my evening visit I found him semi-comatose, and he could only be roused with difficulty. He had considerable venous oozing from the orbit. I believed he had had some hemorrhage beneath the dura mater as the tumor was very far back in the apex of the orbit. I believed blood had entered the orbit by the sphenoidal fissure or optic foramen. However, in thirty-six hours he was better and in three days was quite sensible. The oozing still continued and did not entirely cease for a week. The orbit gradually healed by granulation, so that the patient was able to return home in about four weeks after the operation. The sight remained in *statu quo*. This patient suffered severely from pain in the head. In March he had an attack of paralysis and died May 9. No post-mortem was allowed. There were indications of return of the orbital tumor also.

My second case was that of a man, æt. 53, whose right eye had been abscised twenty years ago. He came to me February 20, 1892, complaining of gradual failure of sight of some months' standing. Left eye $V=\frac{15}{1}$, 10 Sn. The stump of the right eye was hard, tender to the touch, and the seat of occasional pain. Ophthalmoscopic examination of the left eye revealed beginning optic atrophy. I advised immediate removal of the stump, to which, he agreed. I accordingly did the operation. The shrunken bulb was found to contain the

remains of the choroid and retina and some grumous fluid. The first had undergone satisfaction. This man's sight improved considerably for a time, but it failing again, he was put on hypodermic injections of pilocarpine, alternated with strychnia. But in spite of this and other treatment the sight has steadily failed. I believe the optic atrophy in this case was strictly sympathetic and dependent upon the irritation caused by the shrunken stumps. There was no tobacco abuse, spinal lesion, or any cause other than the irritating degenerated eyeball.

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY, AMERICAN MEDICAL ASSOCIATION, JUNE 7, 8, 9, AND 10, 1892, DETROIT.

CHAIRMAN, DR. J. L. THOMPSON, OF INDIANAPOLIS; SECRETARY,
DR. GEO. E. DE SCHWEINITZ, OF PHILADELPHIA.

[CONCLUDED].

IMMATURE CATARACT AND THE BEST WAY OF HASTENING MATURITY.

By Dr. Joseph A. White, Richmond.

The author presented his experience with a little used method, which he calls "the method of paracentesis and external massage." He considered the five other modes of ripening cataract, viz.: 1. Simple division of anterior capsule. 2. Division combined with iridectomy. 3. Division and external massage, 4. Iridectomy and external massage (Foerster's operation). 5. Internal massage directly upon the anterior capsule.

He held that the method he follows is free from all the dangers attending the others and equally efficacious. In the 15 cases operated on, none had any unpleasant sequelæ and the cataract in each case ripened rapidly, the shortest time being two days and the longest two weeks. The advantages of the method are that the cortical masses are opacified, freed from the capsule and more easily delivered in the subsequent

extractions. The time for the operation is when the patient can no longer read.

Contra-indication are, insufficient dilation of the pupil under atropine and a weak zonula. The operation is done by drawing off the aqueous thoroughly after maximum dilatation of the pupil and then rubbing the cornea up and down, from side to side and round about with sufficient force to crush the cortical masses. It is especially valuable in slow developing cataracts in persons under 60 years of age, and it obviates the necessity of removing such cataracts when immature, a proceeding always attended with more or less risk. It also does away to some extent with the necessity of irrigation of the anterior chamber, as the toilet of the eye is much easier in the cataracts thus referred, the cortex being less sticky and readily delivered. He considered irrigation hazardous and to be avoided if possible.

TREATMENT OF INCIPIENT CATARACT.

By Dr. A. J. Erwin, Mansfield, Ohio.

The speaker gave a detailed report of several cases of incipient cataract when the progress of the affection had been retarded by the use of galvanism to the eye and application of tincture of iodine to the eyelid three times a week. He did not advocate medication to take the place of surgical treatment, but when the existing vision is equal to the vision that you would secure after extraction, he thought it well to try to save the lens, thus avoiding the necessity for operation and the risks attending it.

THE METHODS AND RESULTS OF SIMPLE CATARACT EXTRACTION.

By Dr. H. Knapp, of New York.

Dr. Knapp's remarks were based upon 683 extractions performed by him during the past six years; 623 were without, and 60, or 10% with iridectomy. All cases are included. He considers ripening operations superfluous and prefers the risk

of removing an immature cataract to that of artificial ripening. He however avoids operating on cataracts swollen by imbibition. The patient is operated on on a chair under aseptic precautions and when the operation is over, undresses and goes to bed with his eyes open. In from five to thirty minutes the eye is inspected and when the wound and iris are all right, he applies a bandage which consists of a piece of moistened corrosive sublimate gauze and absorbent cotton fastened by two strips of isinglass plaster. Of 125 successive cases treated in this way, one showed at the inspection a distorted pupil (which was made round again by stroking the iris back, but the patient had a subsequent prolapse) and two incarcerations of the iris for which iridectomy was done on the spot; recovery undisturbed.

The most important step of the operation is the corneal section. For ordinary cataracts it should comprise half the circumference of the cornea and pass strictly through the transparent margin, rather trespassing on the cornea than on the sclerotic, the knife remaining in the same plane from beginning to the end of its course, the least turning on its axis being carefully avoided. Such sections close and heal admirably. The capsule is opened with a delicate cutting cystotome behind the iris, parallel to the corneal section. The removal of a piece of the anterior capsule is confined to the thickened center of hypermature cataracts. The lens is expelled by pressing with a Daviel's spoon on the lower end of the cornea. In restless patients and when prolapse of the vitreous is imminent, he removes the fixing forceps and speculum and presses the lens out by pressure of the lids, care being taken to prevent the edges of the lid from coming in contact with the wound, in order to avoid infection. He has seldom had to resort to traction instruments. The remnants are pushed into the wound with the lids and wiped off with a sterilized silver spatula. The iris, if not spontaneously falling back, is reduced with an olive-tipped probe from under the transparent corneal margin. If there is any difficulty and in all peripheric sections it is advisable to make a small iridec-

tomy. In five or six hours the pain disappears. If later, it reappears, but passes in about an hour, prolapse of the iris has, in all probability, occurred. When it is brought to notice soon, the eye is opened and the prolapsed iris cut, otherwise it is dealt with later on. For a time he had cut the prolapse as soon as it was noticed, commonly on the fourth day. The results were unfortunate. Besides good recoveries there was one loss by suppuration and two by irido-cyclitis, followed by sympathetic ophthalmia.

The patients are usually discharged at the end of the second week with an average visual acuteness of $\frac{20}{70}$ which for a few months may somewhat increase, but then gradually sinks, not only after this mode of operation, but after all others except where the lens has been removed in its capsule or in a certain number of cases when a piece of the anter capsule has been removed.

In order to obtain permanently good vision he had for years made a secondary division of the capsule, which he considers now as much as before, an integral step, the final act of the operation in most cases. The dicission can be done as soon as the wound is firmly healed or any time later; but about four to five or six weeks after the operation. It is best done with a knife-needle, so shaped that no aqueous humor escapes and the capsule is cut, not torn. Thus far he had not lost or even damaged an eye by this operation. In ten cases glaucoma developed after it which in the milder cases was cured by pilocarpine; in the severer ones by an iridectomy with a blunt hook. The secondary dicission is a delicate operation, requiring good instruments, perfect artificial illumination and careful examination of the condition of the pupil. Pulling resistant cords to and fro and deep ploughing of the vitreous should be avoided.

The results sum up as follows: The last series includes 346 cases; uncomplicated cataracts, 301; failures, 4; complicated cataracts, 45; failures, 7. Arranged in the usual manner the results were: good, 84%; moderate, 13%; failure, 3%; (to which two eyes lost by sympathy have to be added) Adding

to these the more favorable results in the first series of 300 cases, we obtain 89% good; 9% moderate; 2% failure.

A NEW OPERATION FOR TRICHIASIS AND DISTICHIASIS.

By Dr. Eugene Smith, Detroit.

A clamp is placed upon the lid and an incision made between the normal and faulty cilia extending well up to the hair follicles. The wound is then made to gap and the follicles of the faulty cilia are destroyed by being touched with the fine wire galvano-cautery. During the past five years the speaker had employed this method at least fifty times and always with complete satisfaction.

THE PATHOLOGY AND TREATMENT OF INFANTILE CATARACT.

By Dr. A. R. Baker, of Cleveland, Ohio.

The author called attention to the necessity of having a more uniform classification of cataracts. He expressed the opinion that anterior polar cataracts were nearly always due to perforation, or at least to inflammation of the cornea.

The following conclusions were presented:

1. Infantile cataracts should be operated on early, within the first year if possible.
2. In pyramidal and zonular cataracts in which vision cannot be improved to $\frac{7}{10}$ after fully dilating the pupil, removal of the lens is to be preferred to iridectomy.
3. Soft cataracts are best removed by linear extraction.
4. Soft cataracts, including zonular and capsular, are best treated by first breaking up the lens thoroughly and removing a few days later by the combined linear extraction and suction operation.
5. Small incision is sufficient in very young infants unless nystagmus should be present.
6. Only one eye should be operated on at a time.
7. There are a few cases in which it may be advisable to extract one lens for distant vision, and make an iridectomy on

the other eye, so that a certain amount of accomodation may be preserved for near work.

A CASE OF CONGENITAL ECTOPIA LENTIS.

By Dr. George Friebis, of Philadelphia.

The case reported was that of a boy, 7 years of age, and the following conclusions were presented:

1. Congenital ectopia lentis is usually double.
2. It is a congenital malformation, the cause of which has not yet been positively established.
3. Amblyopia and ametropia are always concomitant conditions.
4. The majority of cases, so far reported, sustain the theory of heredity as the primary cause.

In the discussion of this subject, Dr. Bryant, of Omaha, stated that he had seen a family in which five out of seven children suffer from ectopia lentis, the parents having healthy eyes; and another family in which three children and the mother suffer from the same trouble.

Dr. Morrow referred to a family in which he had seen four cases of this condition and had obtained the history of a fifth member similarly affected.

Dr. Alexander Randall, of Philadelphia, stated that he had seen two cases of dislocation in Jaeger's clinic, and the point had been made that where the dislocation was symmetrical the condition was probably congenital, while if the dislocation was not symmetrical it was probably the result of traumatism.

Dr. Eugene Smith, of Detroit, mentioned the case of a boy who could dislocate the lenses at will by throwing the head forward and replace them by throwing the head back.

INJURY OF THE LENS, WITH CASES.

By B. L. Milliken, of Cleveland.

From a clinical standpoint, injuries of the lens may be divided into two classes: 1. Those where the chief injury is to

the lens mass itself, and, 2. Those where there is, in addition, a grave lesion of other structures of the ball. In the first class are comprised such injuries as bits of steel or iron lodging in the lens substance, spicules of iron penetrating the cornea and lens, but not remaining. The second class is of great importance. The most serious cases of this class are those where there is injury to the ciliary body. The results depend materially upon whether the foreign body remains in the eye or not. Most injuries of the lens are liable to terminate in traumatic cataract, more or less complete, depending upon the extent of the lesion of the lens or capsule. The rapidity of development of traumatic cataract will depend upon the extent of the lesion of the lens, and especially of the capsule. Sometimes opaque portions of the lens change rapidly and considerable areas will be absorbed in a short time. Occasionally a line of opacity will disappear entirely, while again, such a line may remain for years, marking the course of a penetrating body.

Six cases were reported illustrating the points brought forward:

1. Spicule of iron penetrating cornea, iris and lens. Opacity cleared completely. Vision normal.
2. Fragment of musket cap penetrating cornea, iris and lens, and lodging in vitreous. After twenty years only an opaque line through lens. Vision useful.
3. Grain of powder penetrating cornea and injuring capsule and lens, followed by considerable opacity which ultimately cleared up leaving only a spot, and vision nearly normal.
4. Wound of cornea and capsule by a piece of wire, escape of some lens-substance, immediate loss of vision. Opacity occurred, but this gradually cleared until patient could count fingers at 8 feet. The opacity, however, recurred.
5. Injury of both eyes at considerable intervals. At age of 21 years patient received a linear wound of the cornea from being struck with an iron bar, this caused an injury of the capsule. Opaque lens-material was removed by operation, and

by a second operation the capsule was slit with favorable results.

A year later the other eye was struck by a piece of steel at the cornea-scleral junction. In a few days forming traumatic cataract could be seen, after a few weeks this cleared up to a certain extent, but later the cataract involved almost all the lens.

6. A man was struck in the left eye by a piece of steel, he continued working all day, although unable to see. The eye was examined by a physician who did not discover any foreign body. Shortly afterward the opaque lens-matter was removed by operation, but vision remains absent, and the foreign body still remains in the eye.

Few lens injuries but leave some permanent damage. The first requirement is removal of the foreign body when possible, then aseptic and antiseptic washes. Atropia, sufficiently strong, to dilate the pupil and keep the iris out of harm's way is of great value. The eye should be kept at rest, as the cataract is, doubtless, largely due to the abusive use of the eye. The alternate use of atropia and eserine is of service in iritic attachments. In the old the use of mydriatics must be carefully watched to avoid the development of glaucomatous symptoms.

SUCCESSFUL EXTRACTION OF A PIECE OF STEEL FROM AN IRIS
AND LENS BY AN IRIDECTOMY WITH SUBSEQUENT AB-
SORPTION OF THE LENS SUBSTANCE AND RE-
COVERY OF NORMAL VISION.

By Dr. Chas. A. Oliver, Philadelphia.

The case reported was that of a man, æt. 29, who had a piece of steel imbedded in the upper inner quadrant of the iris and lens. Two days after the accident the injured portion of the iris was removed with the foreign body. The lens showed a point of ruptured capsule and was swollen and opaque in the immediate vicinity. Under atropine, light pressure bandage,

rest in bed, and small doses of calomel internally the wound healed and inflammation subsided. In one month the lens was absorbed, the eye quiet, and vision brought to normal by the correcting lens. Fifteen months after the accident the eye was perfectly quiet with a narrow coloboma and +11 sph. \ominus 0.50 cyl. ax. 100° gives normal vision.

A paper by Dr. T. E. Murrell, Little Rock, Ark., on

EYE INJURIES CONSIDERED IN RELATION TO SYMPATHETIC AFFECTIONS,

was read by title, and referred to the Publication Committee.

RESECTION OF THE OPTICO-CILIARY NERVES.

By Dr. Julian J. Chisolm, Baltimore, Md.

In this paper Dr. Chisolm gave his experience of the past eighteen years. He made a strong plea for neurotomy as against enucleation in all cases of eyes which are not deformed in appearance, although they may be sightless, and the cause of much suffering and danger. At the Presbyterian Eye, Ear and Throat Charity Hospital, of Baltimore City, there have been eighty-one of these neurotomies; a sufficiently large number to draw safe conclusions from. He has met with none of the dangers which some surgeons have experienced. In no case has life been jeopardized, nor has there been in a single case any annoying hemorrhage, orbital abscess, cellulitis, corneal sloughing, nor, as far as he is aware, eyeball atrophy. He has not been able to trace all of his cases since they left the hospital. In four cases only, as far as he has been able to learn, has enucleation been required as a subsequent operation. Other patients may have been compelled to have had recourse to this more radical method, but if so it has not come to his knowledge.

He has been visited by many of his patients years after the neurotomy, and found them enjoying perfect comfort from suffering, and with a good looking eye, infinitely more valuable

than any artificial eye that could have been obtained. He thinks that many surgeons have become timid concerning neurotomies from dangers which have followed the operation at the hands of others, without considering the causes which might have induced the trouble. He thinks that most of these can be traced directly to the operative procedure.

The very first year of his trial, he abandoned the elaborate technique as one fraught with danger. The cutting of muscles tended to future deformities, the exposure of the nerve to the eyes of the operator with the extensive dissections necessary to this end, excited cellulitis, and induced complications. His method of operation is of the simplest. Under a general anæsthetic (he administers the bromide of ethyl because of its promptness and also its evanescent nature) he makes an horizontal snip of the conjunctiva running parallel with the lower border of the inner rectus muscle, the duplicate of that made for squint. When the fascia has also been freely opened by means of the scissors, a sharp hook is passed through the wound and into the sclerotic. By means of this the eyeball can be rotated forcibly outward, bringing the bundle of nerves within easy reach for section. The enucleation curved scissors is introduced through the open wound to the back of the eye. Using it as a probe the optic nerve is sought. When this cord is felt the edge of the scissors with its closed blades pressing against the nerve is slowly drawn outward. The moment the nerve escapes the blades of the scissors are widely opened, the nerve bundle caught between them and the entire mass divided. The recognized toughness of the optic nerve and the consequent resistance to the closing of the scissors is a sure evidence that the proper structures have been secured. As another sign that the section has been completed the closed scissors will move in all directions behind the eyeball without meeting any resistance. The ciliary vessels have been divided simultaneously with the nerves. Blood at once escapes into the socket, causing the eye to protrude from between the lids, some blood also escapes from the conjunctival wound. To prevent much eyeball displacement a compress and

bandage is immediately applied firmly over the eye and is left in place for twenty-four hours. Should this firm pressure cause pain a hypodermic injection of morphia brings prompt relief. On examination of the eye the day after the nerve section, complete anæsthesia of the cornea is the evidence that the object of the operation has been accomplished. The patient is ready for dismissal after a very few days the only drawback being a very black eye from blood extravasation, which will take two weeks for removal. This operation is so simple and rapid in its execution, and so devoid of danger that patients will accept it who refuse the enucleation. If an eye is ugly looking, as well as painful and dangerous, no surgeon would advise its retention. But when the dangerous eye is still good looking he gives the patient the chance of retaining it by nerve section. He is sure that he has made a great many happy by this operation, and at the same time has given all the safety that the removal of the eye could have secured.

THE SURGICAL TREATMENT OF TRACHOMA.

By Dr. John E. Weeks, of New York.

The author divides trachoma into three stages: 1. The early stage, in which the granules are still discrete, the conjunctiva hypertrophied, secretion more or less profuse, cornea not affected. 2. In this stage the granules have coalesced to a greater or less extent; there is some cicatricial contraction of the conjunctiva with shortening of the palpebral fissure, the hardened sclerosed condition of the trachomatous tissue has produced pannus and superficial or deep ulceration of the cornea in many cases. 3. This stage is essentially one of atrophy of the conjunctiva with its accompanying conditions, pannus, ulcers and opacities of the cornea. The surgical treatment of the first and second stages was considered based on the following indications: First, the obnoxious tissue should be removed if such a thing is possible without producing too much deformity of the lids; second, the germs instrumental in the

production of the disease should be destroyed if any remain after the mechanical treatment of the surface.

The following is the treatment recommended in the first stage: In the first place the surface should be very superficially scarified, the lines of incision running parallel to the margins of the lid; the contents of the granules should then be expressed (the author prefers Noyes' forceps for this purpose) and a germicide in the form of a solution of the bichloride of mercury, $\frac{1}{1500}$ to $\frac{1}{1000}$ should be introduced into the tissue by means of a tooth-brush. The aftertreatment consists in preventing adhesions between folds of conjunctiva, and of the application of antiseptic and astringent medication. The treatment advocated for the second stage is that known as grattage, an operation introduced by Darier in Abadie's clinic, Paris. For the performance of the operation the author has devised a three-bladed scarificator and a forceps. The operation consists in everting the lids by means of the forceps, scarifying the involved portion of the conjunctiva to two-thirds of the thickness of the trachomatous tissue and scrubbing the surface with a tooth-brush which carries a solution of the bichloride of mercury, $\frac{1}{1500}$. Canthoplasty is done if the palpebral fissure is short. The aftertreatment consist in the use of antiseptics and astringents, and must be continued until the lids assume a smooth surface, which may be from three weeks to a month.

The following conclusions were presented:

In the first stage of trachoma the most efficient mode of treatment is superficial scarification with expression, and the use of a germicide solution introduced by means of a brush.

In the second stage, if surgical interference is advisable, grattage, combined with expression, in some cases; canthotomy or canthoplasty, if necessary, gives the most satisfactory results. The operation above advised converts a contagious into a non-contagious condition.

A FEW EXPERIMENTS WITH THIERSCH'S SKIN GRAFTS IN
THE OPERATION FOR PTERYGIUM.

By F. C. Hotz, of Chicago.

To insure the permanent success of our operations for pterygium we must arrange matters so that the conjunctivæ, after being released from the cornea, cannot be drawn back over cornea again. In pterygia of moderate extent this is usually accomplished if we close up the gap in front of the retracted pterygium by drawing the conjunctiva from above and below to a horizontal linear wound, but if the pterygium is very broad, the defect in the ocular conjunctiva is so large that the edges of the wound cannot be united without considerable strain upon the sutures, they often tear out, the edges separate, cicatricial tissue fills the gap and a return of the pterygium is the ultimate result.

In looking for some suitable material which might be substituted for the conjunctiva, Dr. Hotz thought of Thiersch's skin grafts, which in a number of cases of symblepharon had proven themselves an excellent material for patchwork in the conjunctiva. He had tried this plan in three places. The pterygium was thoroughly dissected back from the cornea and sclero-corneal region and allowed to retract toward the caruncle as much as it would. Upon the large wound-area, resulting from the retraction of the conjunctiva, a Thiersch graft was placed, shaved off from the forearm and directly transported from the razor to the eyeball. It was found best to cut the graft a little smaller than the wound, especially in the horizontal diameter. The graft was carefully spread out smoothly over the wound with its one edge following the margin of the cornea; the graft adhered readily, and after two weeks its whitish color blended well with the white of the eye.

The grafting experiment was successful in all three cases, inasmuch as the grafted piece adhered firmly to the sclera along the corneal border, and formed a strong barrier which effectually stopped the conjunctiva from crossing the corneal

border. Dr. Hotz, therefore, thinks this plan a skin grafting may be recommended as an operative procedure for these troublesome cases of extensive pterygium.

ORBITAL AND OCULAR GROWTHS.

Dr. Joseph A. White, of Richmond, Va., and Dr. Wm. M. Gray, of Washington, reported four cases:

The first was one of intraocular melanotic sarcoma. It originated in the ciliary body and extended backward toward the nerve which was severed three quarters of inch back of the eye.

The other three were extraocular. One was a sarcoma of the orbit, originating in the sub-conjunctival tissue of the lower cul-de-sac. The eyeball had to be removed in order to get at the tumor; a second was a recurrent fibroid of the orbit, extending from the inner and lower orbital edge back to the sphenoidal fissure; the eye had to be scarified in order to enucleate the growth. A third was a tuberculous tumor of the orbit in a healthy girl, aged 16 years. It was attached to the outer and lower orbital edge and extended backward behind the eye. It was removed with preservation of the eye. It was about one inch long and three-quarters of inch wide. The rarity of this kind of a tumor and its development in a young and otherwise healthy girl are of special interest. The paper was illustrated by micro-photographs prepared by Dr. Gray.

Dr. Edward Jackson reported a case of,

IVORY EXOSTOSIS, OR BONY TUMOR OF THE ORBIT,

occurring in a healthy girl of 19, with preservation of vision, and presented the specimen. The tumor had been first noticed two years before and had slowly continued to increase with some pain. The eye was displaced downward and forward about a centimeter in each direction. The growth proved to be an ivory exostosis firmly attached by a broad base to the upper inner wall of the orbit. It was removed through an incision made just below the margin of the orbit, the lids be-

ing stitched together during the operation to prevent exposure of the protruding cornea. The removal was affected chiefly by drilling holes in the bone, breaking it in two pieces and drilling through the base, the operator finding that the saw and chisel had but a limited application. The removal of the growth opened the frontal and ethmoidal sinuses. The wound was dressed antiseptically and united by first intention, the drainage and sutures being removed on the seventh day: At first there was almost complete immobility of the eye with diplopia. The ocular movements were however rapidly regained and when the patient was discharged at the end of one month were again perfect, the only remaining defect being some ptosis; the elevator of the lid being either permanently damaged by the growth or involved in the cicatrix. Although vision was not perfect in the eye involved, the amblyopia with high hyperopic astigmatism probably antedated the tumor.

A CASE OF RARE FORM OF ORBITAL TUMOR,

was reported by Dr. Geo. E. Frothingham, of Detroit, with exhibition of the patient.

Dr. Robert D. Gibson, of Youngstown; Ohio, read a paper giving his

RESULTS IN THE TREATMENT OF KERATOCONUS BY MEANS OF GALVANO-CAUTERY AND IRIDECTOMIES.

THE ETIOLOGICAL RELATIONS OF NASAL DISEASES TO AFFECTIONS OF THE EYES.

by Dr. H. Gradle, of Chicago.

The proof that certain ocular affections are the consequence of nasal disease may be furnished in various ways. First, we can observe the extension of nasal disease into the orbit and appendages of the eye. Second, we may find clinically certain eye diseases occurring so regularly in connection with nasal affections as to suggest the dependence of the former upon

the latter. Third, we may be able to influence the course of eye diseases by nasal treatment. American authors have dwelt mainly on eye symptoms of nasal origin, but there are besides actual eye diseases with visible lesions, the etiology of which must be sought in the nose. The nasal origin has been proven in the following instances:

1. Disease of the tear passages (in the majority of cases) besides mere reflex lachrymation.
2. Vascular disturbances of the lids varying from œdema to an erysipelatoid condition; certain cases of blepharitis.
3. Conjunctival congestion and indirectly chronic catarrh (of which nasal diseases are not the only cause). Certain forms of acute conjunctivitis accompanying coryza.
4. The dependence of some forms of corneal disease upon nasal disturbance, is probably, but not definitely proven. The author's experience refers to phlyctenular disease and to sclerosing form of vascular keratitis.
5. Some attacks of iritis.
6. An ill-defined disease suggesting glaucoma, characterized by reduction of sight, visual field and accommodation with intra-ocular congestion.
7. The optic nerves may become involved by extension of disease from the sphenoid sinus.
8. Some of the peripheral forms of paralysis of the ocular muscles.
9. Some inflammatory forms of orbital disease and some orbital tumors originate in diseases of the nose and accessory sinuses. Exophthalmic goitre has, in a few instances, been cured by intra-nasal treatment.
10. The most frequent ocular troubles of nasal origin, are the functional derangements, such as itching and burning of the lids, feeling of dullness or shooting pains and less commonly aching. With these annoyances there may or may not be asthenopia. If present, the latter depends generally upon intra-ocular causes, but cases of purely nasal origin also occur. Other functional disturbances which can sometimes be traced

to the nose as their starting point are fugitive scotoma, blepharospasm and chorea of the lids.

STRICTUROTOMY FOR THE RADICAL CURE OF STRICTURE OF
THE LACHRYMAL DUCT—ALSO A STRICTUROTOME.

By Charles Hermon Thomas, M.D., of Philadelphia.

In the treatment of stricture of the lachrymal duct, no method of treatment is so generally adopted as that of dilatation, but the results, are as a rule, unsatisfactory. In 1868, Stilling described a method employed by him for the treatment of stricture of the lachrymal passages by internal division and described the knife which he employed. While the operation seemed to be correct in principle and likely to give good results, the instrument figured did not seem to Dr. Thomas to be well adapted for the purpose. In order to carry out this plan of treatment, the author had made, in 1869, an instrument which he had employed for the past twenty-two years with excellent results. The instrument consists of a combined sound and knife with a flexible shaft permitting it to be bent to any convenient curve. The conical tip serves both as a guide and as a dilator.

In operating the first step is the slitting of the canaliculus, the lower if a style is to be used, otherwise the upper one. The cut is to be made along the inner edge of the lid and the opening into the sac must be made sufficiently large to admit of the insertion of the necessary instruments. The canal is next explored by Bowman's or William's probes to locate the position and calibre of the stricture. The stricturotome is then well oiled and introduced, special care being taken to place the point of the instrument within the grasp of the stricture. Gentle, steady pressure is then made and the cone and blade carried through and beyond the constriction. The blade is then withdrawn sufficiently to engage the stricture and incision made, completely dividing the strictures at the strictured point, even to the bone, in at least three different direc-

tions. The instrument should now be moved laterally in all directions, to make sure that no narrowing remains, and before withdrawal it should be carried into the nasal fossa as an exploring instrument. The most common seat of stricture is at the junction of the sac and duct. The whole procedure is singularly free from pain and with cocaine the pain is insignificant. There is very little hæmorrhage.

In the after-treatment a large leaden style, eight or ten millimeters in circumference is usually introduced. The upper extremity of the style is bent at right angle and so reduced in size as to drop into the groove formed by the divided canaliculus. At first this is removed every day or two, but after the first ten days, it need not be disturbed for a week at a time. At the end of a few weeks, the style may be removed altogether. The speaker thought that probably the chief reason why the operation of Stilling had not met with more favor had been the formidable character of the instrument which he recommended.

As compared with probing, stricturotomy promises immediate relief and a radical cure, while probing is tedious, painful, and often ineffectual. Stricturotomy was not recommended in all cases of epiphora, nor yet in all cases of dacryocystitis.

The speaker had recently had the opportunity of examining the first case on which he had operated by this method, more than twenty-two years ago. This lady had suffered from stricture of the duct, causing dacryocystitis and epiphora. She had been perfectly well from the time of the operation to the present day. Pressure over the sac shows not a trace of regurgitation and a large Bowman's probe is readily passed into the nose without encountering the least indication of stricture.

In the light of all the facts, the author felt warranted in stating his belief that the time has come when probing as a method of treatment should be discarded, and also that stricturotomy as here described—based as it is upon sound surgical principal and supported by experience—should be substituted

for it, and all other instrumental procedures now in use for the treatment of stricture of the lachrymal duct.

HETEROPHORIA AS A CAUSE OF RHINITIS AND TINNITUS AURIUM.

By Dr. Leartus Conner, of Detroit.

He reported a case of a young woman with rhinitis followed later by tinnitus aurium. The attacks of rhinitis occurred on an average once a week and lasted from two to four days. These attacks had been present for eighteen months and were gradually getting worse. Exophoria was noted and in February, 1891, a three-degree prism was placed before each eye. In a few days this was increased to four degrés and finally to six degrees. After the use of the prisms, no local treatment being employed, there was no return of the rhinitis for two weeks. The prisms were then laid aside and in twenty-four hours there was an attack of rhinitis. For three months while wearing the glasses she has been free from the attacks and the tinnitus is gradually diminishing.

THE CONSERVATIVE MANAGEMENT OF LACHRYMAL OBSTRUCTION.

By Dr. Samuel D. Risley, of Philadelphia.

The author claimed that there were many cases of partial lachrymal retention which were liable to be overlooked since the retention was obvious only under exposure or during the use of the eyes at near work. The retained tears however, were the cause of much discomfort in the use of the eyes because of the resulting conjunctival hyperæmia and the disturbance of corneal refraction by the pellicle of tears. It was claimed that this condition was due in some instances to contraction of the lachrymal punctum which it was demonstrated by a series of microscopical sections and drawings was provided with a sphincter muscle; and in others to affections of the mucous membrane in and around the nasal end of the lachrymal duct. In treating this condition, simple dilatation of the sphincter was often sufficient, but when this failed, it

should be nicked in the direction of the canaliculus and kept permanently open. In treating the milder forms of blenorrhœa of the sac, either acute or chronic, it was often sufficient to nick the punctum which then readily admitted the point of the syringe, and permitted thorough cleansing of the sac and the application of any desired treatment to its inflamed walls. The closure of the nasal duct, it was held is often due to the uniform thickening of the lining membrane rather than to a stricture at special points. The treatment should therefore be directed to the relief of the general thickening. While the use of probes is frequently necessary, a successful issue can often be reached by careful syringing and internal medication. After the instillation of cocaine through the syringe into the sac, the thickening of the tissue is reduced and fluids will often flow freely into the nose. After thorough cleansing, solutions of nitrate of silver gr. j to the ℥j, tannin or weak iodine solution may be instilled. The painful probing of the duct can, by these means, be avoided in many cases. When the probes are a necessity, they should be only large enough to pass snugly through the duct and should be inserted with a great care, certainly without violence lest the inflamed and brittle membrane lining the uneven surface of the bony duct should fold before the end of the probe and be torn, and the probe be forced downward between the bone and the mucous membrane, an accident which always retarded the progress of the case and often did permanent injury.

The speaker urged the frequency with which the tear duct trouble was associated with affections of the nose, in some cases unquestionably secondary to it, in others the trouble on the floor of the nose and at the anterior end of the inferior turbinated bone, seemed to be due to the absence of the usual flow of tears which permitted the parts to become dry and liable to disease. On the other hand, there had, in his experience, been a larger group of patients in which the lachrymal retention and hyperæmia of the drainage system were unquestionably a part of the chain of symptoms associated with eye strain. The cases with marked choroidal disturbance, associat-

ed with astigmatism are prone to thickening in the retro-tarsal folds, swollen caruncles and epiphora. Typical cases were detailed in which the most varied and painstaking treatment had been unsuccessful until the existing error of refraction had been corrected or the nasal trouble removed by treatment. In young children surgical treatment is rarely needed and cases recorded of adults in which the usual treatment was fruitless until other manifestations of syphilis were detected, and rapid recovery from the epiphora followed the mixed treatment alone.

CLOSURE OF THE LACHRYMAL PUNCTA IN DACRYOCYSTITIS
AS A BARRIER AGAINST INFECTION OF THE
WOUNDED EYEBALL.

By G. A. Aschman, M.D., of Wheeling.

An unsound condition of the lachrymal passage is a constant menace to the eyeball. The rule is not to operate for cataract, etc., when dacryocystitis is present, or at least before it has been cured. Twenty or thirty per cent of cases of hypopyum keratitis are complicated with dacryocystitis. Persons afflicted with some disease of the lachrymal passages are not inconvenienced to a very great extent and many years may pass until by some slight injury corneal epithelium is removed and the opportunity for infection is given.

The source of the ulcer is often overlooked until hypopyum keratitis has developed and an oculist is consulted. Prompt treatment is then necessary. The usual method is scraping the floor of the ulcer, antiseptic applications, dusting with iodoform, cauterization of the ulcer, paracentesis or the Sæmisch operation. Statistics show that in 9.5% to 19.2% of such cases destruction of the eyeball results.

It had appeared to the author that not enough attention is paid to the source of infection, etc., the lachrymal disease, although the text-books advise to slit the canulaculus and to treat the sac and duct with probe and syringe. But the treat-

ment of dacryocystitis demands time and in the meanwhile the eye may be lost. In order to prevent the entrance of septic matter from the passages into the conjunctival sac the author had, during the past year, endeavored, after thoroughly disinfecting the implicated parts, syringing the sac and duct, etc., to effectually close both lachrymal puncta. This was accomplished by passing a fine electro cautery wire one-eighth inch into the canaliculus, burning the mucous lining with a red heat which resulted in firm adhesion of the walls. Three cases were cited, two of which were advanced hypopyum keratitis resulting from an injury contracted ten or sixteen days before. Muco-purulent dacryocystitis; anterior chamber half full of pus. After the usual treatment, Sæmisch's operation was resorted to. The pus was entirely evacuated, but they did not get better until the lachrymal puncta were closed in the manner described, when recovery rapidly followed. The puncta were easily re-opened afterward. The third case was one of recent ulcer corneæ after injury. No hypopyum, but dacryocystitis. The puncta were closed and recovery was rapid.

In order to close the lachrymal passages a clamp compressing the canaliculus has been devised but does not seem reliable. The canaliculi have also been closed by the catgut ligature.

PURULENT OPHTHALMIA.

By Dr. George M. Gould, of Philadelphia.

The paper referred to the method of infection, treatment and prophylaxis of this affection. He called attention to the obstinacy of the disease to all methods of treatment and the implication of the second eye despite isolation. He believed an explanation of these characteristic features was to be found in the role played by the nose and lachrymal passages as hiding places and ways of transfer for the specific germs; and that the eyes may become originally infected through the nose, the germs ascending by the lachrymal duct and sac. To prevent

repeated re-infection of the eye, the treatment should include the rendering aseptic of the canaliculus, sac and lachrymal duct.

INSUFFICIENCIES OF THE OBLIQUE MUSCLES AND HOW TO CORRECT THEM.

By Dr. G. C. Savage of Nashville, Tenn.

This condition was first described by him in *The Archives of Ophthalmology*, Vol. XX, No. 1, 1891. The means of determining the existence of this condition is the Maddox prism. The eye under test is the one before which the prism is not. The patient looks at a card, on which there is a single horizontal line held at twelve to sixteen inches from his eyes. The one line is seen as three lines, the middle one of which is seen by the eye under test. It is a physical impossibility for the upper and lower lines to be other than parallel. The middle line should be parallel with them, but it may dip to the same or toward the opposite side. If it dip toward the opposite side the superior oblique is insufficient, if toward the corresponding side, the insufficiency is in the inferior oblique. The insufficiency is usually symmetrical, though there are cases in which it is not symmetrical.

The correction of symmetrical insufficiency is gymnastic exercise of the weak muscles by means of either convex or concave cylinders varying in strength from .50 D. to 3.00 D. and in some cases even a stronger prism may be used. If the superior obliques are wanting in power and the convex cylinders are chosen, their axes must be in the lower temporal quadrant; if concave, in the lower nasal quadrant. If the inferior obliques are insufficient, the placing of these cylinders is reversed. Beginning at 10° from the vertical the exercise is commenced; after the three minutes the axes of the cylinders are moved 10° farther from the vertical and allowed to remain three minutes, and so on until the axes are 45° from the vertical, the point of their maximum strength. The exercise is continued twelve to fifteen minutes during which time patient

is looking steadily at a candle twenty feet distant. The exercise is repeated daily, on the first using a weak cylinder, on the second a stronger and so on, but each day graduating the exercise. By testing for the condition it will be seen that the middle line becomes more nearly parallel with the other two daily. The patient as cases already treated show, get relief.

Dr. S. C. Ayres of Cincinnati, Ohio, reported a case of

EMBOLISM OF THE CENTRAL ARTERY OF THE RETINA, OR
THROMBOSIS(?)

and referred to the points of differential diagnosis between the two conditions.

MONOCULAR DIPLOPIA.

By Dr. R. Tilley of Chicago.

He repeated the general features of a case reported by him in 1888 in the AMERICAN JOURNAL OF OPHTHALMOLOGY, and completed the history of the same. The patient who was also color blind recovered from both symptoms but died about eighteen months later. He reported four other cases in which the chief features manifest were confined to the diplopia associated with a certain amount of asthenopia. From the fact that in all the fatal cases followed by autopsies, lesions generally extensive were found in the brain, especially marked in the posterior region of the hemisphere, it was inferred that the lesion producing the phenomenon was cerebral and probably cortical. From the demonstration of syphilis in the father in one case, the large amount of infantile mortality in the family of another and the extensive involvement of the cervical glands in another, it was suggested that hereditary syphilis was probably the prime cause of the lesion. The chief features in all the fatal cases were great pain in the head, convulsions, severe vomiting and monocular diplopia. The author was disposed to accept the proposed theory of Professor Foutan as

temporarily satisfactory, namely that the impressions produced on the retina divide with the nerve at the chiasm and are appreciated by the cortex as two impressions, that in the normal condition, these are combined by uniting nerve fibres, that when these fibres are interfered with, monocular diplopia results.

EMBOLISM OF THE CENTRAL ARTERY OF THE RETINA.—WITH
THE REPORT OF THREE CASES.

By Dr. G. E. de Schweinitz, Philadelphia, Penn.

The author described three cases, in one which he had the opportunity of studying the eye ground twenty minutes after the lodgement of the embolus. Under these circumstances, the fog-like œdema of the retina was observed to begin simultaneously in a peri-papillar haze, and a small somewhat more dense infiltration covering the macular region, the two banks being separated by a portion of comparatively unaffected retina. Gradually they approached each other and the infiltration became general. In the lower temporal vein there was a moderately rapid circulation of blood which flowed toward the disc. Vigorous massage of the eye ball produced no effect upon the embolus and no material change in the ophthalmoscopic appearances. There was a primary complete dwindling of the entire arterial tree, followed seventeen hours after the lodgement of the embolus by an increase in the size of the arteries, with the single exception of the inferior temporal artery which remained thread-like. During this period there was faint return of light perception, which had previously been abolished. This state of affairs continued for 12 days, when the vessels again shrank to mere threads and vision was obliterated. In the other two cases, one studied five months after the accident and the other fifteen hours after the obstruction to the circulation, there was preservation of a small portion of the field of vision on the temporal side, in spite of the apparent complete obliteration of the central artery. In the one case the form sense was preserved in this area upon the temporal

side and in the other case only light-sense. In neither case was there a cilio-retinal vessel. The reporter discussed the differential diagnosis between complete and partial embolism and touched upon some points of difference between thrombosis and embolism of the central artery.

ZONULAR ATROPHY OF THE CHOROID.

By Dr. R. Tilley, of Chicago.

The author reported the case of a man 65 years of age, who for the greater part of his life was an English sailor. There was no specific history. He has a marked intermittent pulse associated with a certain amount of valvular irregularity. There was a history of Dupuytren's fingers in the father and brother of the patient, and this condition was marked in several fingers of the patient himself. He had an incipient capsular cataract in both eyes and in the choroid of the right eye an almost complete band of atrophy, embracing the region of the macula, the widest part being in the lower part of the fundus, and the narrowest part which still presents certain bridges of choroidal tissue not yet atrophied is in the region opposite the O. D. The subjective symptoms complained of consist of a blackish-brown area of loss of vision in the centre of the field and extending upwards. In that region there is a continual whirl of colored sensations, the rotation being towards the nose. The island of tissue within the zone was apparently normal.

The following were elected the officers for the ensuing year:
Chairman, Dr. Samuel D. Risley, of Philadelphia.

Secretary, Dr. H. Gradle, of Chicago.

After passing a vote of thanks to the retiring officers, of the Section adjourned.

AMERICAN SURGICAL ASSOCIATION.

Dr. W. H. Carmalt, of New Haven, read a paper entitled:
CONDITIONS DEMANDING EXCISION OF THE GLOBE OF THE
EYE.

As a rule, the question of the propriety of enucleating an eye will be referred to the specialist, but there are cases of emergency in which the general surgeon is called upon to act promptly. In the consideration of this subject we are at once confronted with it from two different standpoints, according as we have to deal with blind eyes or with those in which there is a more or less useful degree of vision.

In the case of blind eyes, the objections to the operation are two:

1. The danger of the operation *per se*.
2. The cosmetic appearance.

Meningitis has occurred in some cases operated on in the acute stage of suppurative panophthalmitis. In these cases, the removal should be made just as soon as the evidences of suppuration are unmistakable. In cases of lacerated or penetrating wound with loss of vision, the operation is better done before suppuration occurs, or as soon as the evidences of suppuration are sufficiently plain.

There is no one condition for which the eyes are so frequently excised as in sympathetic ophthalmitis (threatened or actual). The pathology of the sympathetic process is still a matter of controversy. In a case presenting the irritative symptoms indicating the beginning of sympathetic ophthalmitis, with the other eye lost from injury, or certain forms of disease yet to be mentioned, it is the duty of the surgeon to advise in the most unqualified manner the enucleation of the blind eye. The irritative stage is usually short. It is more

or less rapidly followed by diminution of vision due to an organic lesion. In the acutely inflammatory stage of the sympathetic disease, the removal of the "excitor" is not so beneficial to the "symyathizer," and may be harmful, adding fuel to the already flaming fire. In these cases the operation should be postponed until the active process is subdued. It must also be remembered that in a small number (perhaps about 10 per cent) the sympathetic inflammation may come on after the removal of the excitor, and in about 2 per cent it has been thought to have been the result of operation. The conditions liable to give rise to sympathetic ophthalmitis are:

1. Injuries; diseases. Injuries: *a*, lacerating or perforating wounds, so severe that the result will inevitably be atrophy of the globe; *b*, the lodgment of a foreign body in the interior of the globe; *c*, a penetrating wound involving the ciliary region. Diseases: *a*, recurring or chronic iridochoroiditis from whatever cause; *b*, atrophy of globe following purulent keratitis, or panophthalmitis, or in which ossific degeneration of the choroid has taken place; *c*, atrophy of the globe from any cause with painful ciliary region. Time does not confer immunity against sympathetic diseases. There is considerable difference as to liability to the disease in the various injuries and diseases. The sequence is more frequent after injuries than after non-traumatic diseases, and of injuries, nothing is so potent as the lodgment of a foreign body in the eye.

The pain which comes from the intra-ocular pressure of a chronic glaucomatous degeneration is frequently so excessive as to justify the removal of the offending organ—other means of treatment having failed.

Various diseases of the eye leave the organ in conditions so inconvenient or repulsive in appearance that the surgeon's aid is sought for purely cosmetic purposes. Are there, however, no procedures that may be substituted and avoid so severe a mutilation? In the earlier days of ophthalmology, abscision of the anterior segment of the globe was often practiced. In this operation more or less evisceration of the contents of the globe takes place. As a matter of fact, the result is about the

same as after enucleation, and sympathetic ophthalmia may follow the operation. The opinion of the author was decidedly against such risky procedures—enucleation of the misshapen eye, with the introduction of an artificial, is the only admissible operation. The modern expedient of tattooing a white cicatrix of the cornea without staphyloma has resulted in sympathetic disease.

The enucleation of blind eyes that are the seat of phosphenes, like many operations undertaken to relieve a symptom of nerve irritation, it is of doubtful utility.

In regard to the enucleation of eyes only partially blind, it goes without saying that a condition of things which can allow it to be seriously contemplated must apply with greater force to eyes already blind. The chances of accident or independent disease to the remaining eye are sufficiently great to justify the statement that nothing but the certainty of ultimate blindness to both, or of death, can permit us to consider such a procedure.

Most of the intra ocular tumors are sufficiently dangerous to life to demand the removal of the organ in which they are contained, as the only hope that can be entertained of successfully combating their encroachment. They are of two classes: the granulomata and sarcomata.

The extra-ocular growths are of greater variety of histological structure. In sarcomata of the orbit removal of the globe is often required, even when not implicated in the disease.

Should an eye which retains an appreciable degree of vision be removed in order to arrest a threatened or prospective attack of sympathetic disease in the fellow? It is certainly unjustifiable to remove an injured, but still seeing eye, though it may be an excitor of sympathetic disease. The result of the operation has not been sufficiently successful in arresting the progress of the malady after it has begun to warrant its recommendation. The only condition in which it was considered justifiable to remove a still seeing eye, for sympathetic disease, is where a foreign body remains in the eye. In these cases sympathetic disease is very apt to follow.

THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IX.

AUGUST, 1892.

No. 8.

ORIGINAL ARTICLES.

CONGENITAL PTOSIS.—REPORT OF A CASE
TREATED BY PANAS' OPERATION.¹

BY T. C. EVANS, M.D., LOUISVILLE, KY.

Mr. President and Fellows of the Society.—I wish this evening to exhibit a case on which I operated two years ago. This child was brought to my office in May, 1890, the subject of congenital ptosis. There was entire absence of the levator palpebræ muscle with great flattening of the ossa nasi and well marked epicanthus. In order to look at objects even a little below the horizontal meridian she had to throw the head backward, distort the face by tension of the orbicularis oris, zygomaticus and other facial muscle in her efforts to widen the palpebral commissure by depressing the inferior lid. While the occipito-frontalis scarcely made an impression on the superior lid, the movements of the globe were normal and the vision was apparently perfect. As the father was exceedingly anxious to have something done, I decided to perform what is

¹Reported to the Louisville Clinical Association, May 17, 1892.

known as Panas' operation, which was done by making an incision from one canthus to the other, interrupted in its middle for about one-third of an inch; this incision followed the furrow of division between the tarsal cartilage and the orbital portion of the eyelid. A horizontal incision with a slight convexity upward and about three-quarters of an inch in length was then made just over the orbital margin passing down to the periosteum. Then, by two short vertical incisions through

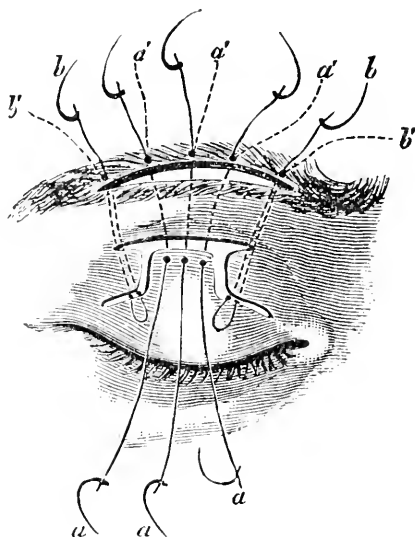


FIG. 1.

the integument this incision was joined to the first incision at the border of the tarsus. Still another horizontal incision was made along the upper border of the eyebrow deep enough to extend to the periosteum and about an inch in length. Then the little peninsula of skin marked out by the middle, lower, and vertical incisions was dissected from the tarsus down almost to its ciliary margin. Then the bridge between the two horizontal incisions was undermined and the peninsula of skin from the lid passed under the brow and securely stitched to

the superior lip of the upper incision. I operated on one eye at a time with interval of about one week between the operations.

The accompanying cuts illustrate the steps in the operation. Fig. 1 shows the incisions. Fig. 2, the operation complete. The wounds were dressed with collodion and iodoform without bandages. The object of the operation is to have the occipito-frontalis assume as far as possible the function of the missing levator palpebræ muscle without interfering with the closing of the lids.

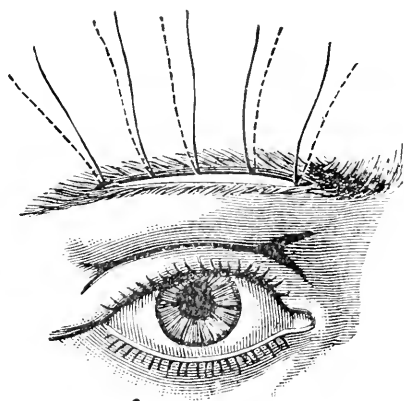


FIG. 2.

She has, as you see, pretty good control of the upper lid by the action of occipito-frontalis and no longer distorts the face in her efforts to depress the inferior lid. She has been in school for the past year and has no trouble in keeping up with her classes.

The only disfigurement from the rather extensive operation is the small pit under the brow where the slip of integument was passed through. A few hairs persistently grow from this opening. This is the only case in which I have attempted this operation, in fact the only time I have ever seen it performed. While the result has not been perfect so far as correcting the

deformity is concerned, the improvement has been so marked as to lead me to regard this as the most rational and the most successful of the various operations that have yet been devised for the relief of this peculiar and distressing deformity. If I have occasion to again perform this operation I shall modify it by making my superior horizontal incision higher and nearer to the median line and also make the dissection and insertion of the flap nearer the median line thereby getting a closer connection between superior lid and the more athletic portion of the occipito-frontalis muscle. I shall also be more careful in removing the hair bulbs from the end of the flap before passing it under the brow. For the epicanthus I followed Arlt's method of excising a triangular piece of the fold on either side of the nose.

The epicanthus and the flattening of the nose generally disappear to some extent as the child develops. In this case there has been very considerable development of the parts since she has been under my observation. I regret that I did not secure a photograph of the case before the operation. But the deformity was so great that the parents very naturally objected to having it photographed.

SOCIETY PROCEEDINGS.

AMERICAN OPHTHALMOLOGICAL SOCIETY.—
TWENTY-EIGHTH ANNUAL MEETING HELD
AT FORT GRISWOLD HOUSE, NEW LON-
DON, CONN., JULY 20 AND 21, 1892.

FIRST DAY.—MORNING SESSION.

The Society was called to order by the Vice-President, Dr. George C. Harlan, of Philadelphia. The first paper read was entitled:—

“History of a Case of Gunpowder Injuries to both Corneæ, Irides and Lenses, with Subsequent Restoration of Vision to Almost Full Acuity.” By Dr. Charles A. Oliver, Philadelphia.

The patient, a young man, æt. 18, July 4, 1891, received the powder contents of a blank cartridge squarely in the face from a distance of three feet, the gravest part of the injury being several penetrating wounds of both corneæ with deposition of powder in both irides and lenses. He was brought to Will's Hospital several hours later. The particles of gunpowder were removed as thoroughly as possible from the corneæ, conjunctivas and sclerotics under cocaine and atropine. When the patient was first seen by the writer, sixteen hours after the accident, there was found to be in the left cornea a rather peripheral wound, with corresponding tear in the iris, through which a powder grain could be seen sticking to the lens. An-

other deep wound extended almost through the cornea. The fundus was apparently normal. In the right eye there was a penetrating wound of the cornea, with injury to the iris. The lens was swollen and rapidly becoming opaque. Four days later there was an outburst of secondary glaucoma. Eserine and cold compresses were then employed, and the following day an iridectomy was made. The wound healed promptly and atropine was resorted to on account of slight tenderness in the ciliary region. In the left eye was continuous improvement. When the patient was discharged, September 4, there was good perception of light in both eyes. In the left eye there was considerable unabsorbed lens matter. The right eye had normal tension. Most of the lens matter seemed to have been absorbed. The lower half of the pupil was covered by a thin opaque sheet of capsular debris. Two weeks later a broad round hole was made in the lower half of the capsule, securing vision of $\frac{5}{x}$ with proper correction. A free double discission of the left lens was also done, obtaining vision of $\frac{5}{x}$. Since the discharge of the patient (one year), the eyes have remained perfectly quiet and the patient pursues his occupation of outside delivery agent in a large retail store.

"Removal of Fragment of Steel from the Vitreous Chamber by Means of the Electro-Magnet with Preservation of Nearly Normal Vision." By Dr. Samuel Theobald, Baltimore.

The piece of steel which was very small had passed through the margin of the cornea and through the iris near its periphery, but fortunately missed the lens. It had been in the eye eleven days when the attempt was made to extract it, and had excited a dangerous degree of inflammation. Owing to the clouding of the vitreous humor, its location could not be determined with the ophthalmoscope. Under antiseptic precautions a longitudinal incision, about 4 mm. long was made through the sclerotic and deeper coats of the eye, between the inferior and external recti-muscles and back of the ciliary

body, through which the magnet point sterilized by boiling water, was introduced into the vitreous chamber. After several unsuccessful attempts, the bit of steel was withdrawn adhering to the magnet point. There was considerable hæmorrhage, but no loss of vitreous. The after-treatment consisted in the application of a lotion of opium and boracic acid and the instillation of atropia. The case made a rapid and uninterrupted recovery, and the eye is now (three months since the removal of the foreign body), very nearly normal in appearance, the pupil being not quite circular, is free from inflammation and photophobia, has a clear vitreous and has vision= $\frac{20}{xxv} +$.

“Foreign Body in the Retina.” By Dr. F. Buller, Montreal.

The patient, a young man, æt. 20, had received an injury of the left eye six days before coming under observation, by being struck with a piece of metal. There was a penetrating wound of the cornea with perforation of the iris and zonula, but no opacity of the lens. A short distance below the papilla was seen a piece of metal lying in the retina. Rest and instillation of a 2-grain solution of atropia was ordered. A zone of opacity around the foreign body, gradually increased in size. Twenty-six days after the injury the eye felt well. Vision= $\frac{6}{xii}$. There were pronounced evidences of neuro-retinitis. The piece of metal was still quite distinct. For a considerable distance around the foreign body there was marked atrophy of the choroidal pigment. Fourteen months later, the eye was still giving trouble. Vision= $\frac{6}{xxvii}$. There was diffuse hyalitis with fine opacities in the vitreous. The optic nerve was red and swollen. The foreign body had, however, entirely disappeared from view. Its former seat was marked by a small patch of pigment. It was thought that an attempt to extract the foreign body would probably have to be made under less favorable circumstances than if it had been made while the body was in sight.

"A Case of Traumatic Irido-Choroiditis from Contusion of the Eyeball Ending in the Development of Intra-Ocular Glioma."
By Charles Stedman Bull, M D , New York.

The patient was a little girl, æt. 3, who had been struck on the left eye ten days before by the bowl of a large spoon. There was no rupture of the eyeball. The child at once complained that she could not see. Ten days later the eye was sightless, there was a central infiltration of the cornea, with loss of epithelium. The iris was dilated, discolored and immovable. The vitreous was hazy and there was a yellowish reflex from the nasal portion of the fundus due to an exudation. There was no pain or sensitiveness on pressure. The child was and had always been perfectly healthy. One week later, numerous hæmorrhages occurred in the retina and vitreous, and the tension was increased. All external signs of irritation then subsided. Three months later a detachment of the retina occurred, involving nearly two thirds of the fundus. The yellowish reflex still remained and vessels were seen running over it. The tension still remained above normal. Six weeks later the sclera in the ciliary and equatorial regions became thinned. Enucleation was urged but refused by the parents. Four months later the child was much worse. She was anæmic and emaciated. There was a large ciliary and equatorial staphyloma; there was no anterior chamber. The lens was opaque and crowded against the cornea and the tension much increased. The parents now consented to an enucleation, nearly a year after the occurrence of the injury. The child at first improved very much in health, but two months later she complained of headache and nausea and the pre-auricular and submaxillary glands were found enlarged. Three weeks later a growth was discovered in the orbit and the upper cervical glands became enlarged. All the symptoms grew steadily worse, and three months after the enucleation the right eye became involved, a small yellowish deposit being found in the inferior temporal quadrant. The left orbit became filled with the growth, all the glands on the left side became enormously

enlarged, the child became gradually stupid, then comatose, and died sixteen months after the occurrence of the blow on the left eye.

No autopsy could be obtained. A microscopic examination of the left eye showed gliomatous masses developed in a matrix of exudative tissue.

"Hyaline Bodies (Drusen) in the Nerve-Head." By Dr. G. E. de Schweinitz, Philadelphia.

The author described hyaline bodies in the nerve-head from the standpoint of microscopic examination, and reported a case in which, during life, he had observed the well known experiences of the globular formations in the papilla, and afterward had the opportunity of making a thorough microscopic investigation. The patient was a male, æt. 45, without important points in his clinical history, except a record of having been injured in the head some twenty years ago. The optic nerves were partially atrophic, and the globular masses, on ophthalmoscopic examination, appeared in a circle slightly within the apparent margin of the nerve-head, and were capped with shining particles which glistened like cholesterin crystals. At the post-mortem examination the eyes and brain were removed. The following lesions were present:

1. Compound hyaline bodies, or "drusen" in the nerve-head, situated in their seat of predilection within the tissue of the papilla, anterior to the lamina cribrosa.

2. Atrophy of the optic nerve, which may or may not have antedated the formation of the "drusen," but which evidently was not caused by them.

3. Thickening of the coats of the arterioles in the optic nerve below the lamina, and in the central artery in the neighborhood of the "drusen," a change in the adventitious coat of the vessel suggesting hyaline degeneration; but proved by differential stains to be composed of a different material from the "drusen."

As negative results it was stated that (1) the retina and

choroid exhibited no distinct pathological lesion, save some thickening of the vessel walls, and that excrescences springing from the lamina vitrea were absent; (2) the other cranial nerves, so far as examined, were normal; (3) the investigation of the structures of the brain, made by Dr. Francis X. Dercum, yielded a negative result, and hyaline changes in the blood-vessels were not present.

The author is in accord with Hirschberg, Circinone and Gurwitsch, believing with these observers that the "drusen" have nothing in common with the choroidal excrescences, but that they are the expression of a pathological process confined to a small portion of the optic nerve, possibly on account of local anatomical reasons. His own case is interesting, not only as confirming the observations of the authors just quoted, but also because his examination included, not merely the nerve-head, but a very considerable portion of the optic nerves and also the brain, and on account of the negative results tended to confirm the belief in the local nature of the disease. The apparent hyaline change in a portion of the adventitious coat of the central artery was interesting, probably only, however, as an associated condition, and having to do rather with the inflammatory state which had preceded the optic atrophy, than with the pathological process which was responsible for the formation of the "drusen." The paper was freely illustrated with photo-micrographs prepared by Dr. William M. Gray, of the Army Medical Museum.

"Two Cases of Symmetrically Placed Opacities of the Cornea, Occurring in Mother and Son." By Dr. Charles A. Oliver, Philadelphia.

On February 23, 1891, a boy, *et.* 8, came under observation with opacities of the cornea. These had been noticed for a long time, but one year previously had enlarged and become conspicuous, following an attack of malarial fever. There was no evidence of congenital syphilis. Laveran's corpuscle was looked for, but not found. In each cornea there is a central

opacity surrounded by a ring of superficial pin-point opacities. There is and has been no evidence of inflammation. During the sixteen months that the patient has been under observation there has been no change in the appearance of the cornea.

Examination of the mother's eyes showed similar opacities of the cornea which had been present as long as she could remember. The woman was apparently perfectly healthy and free from all evidences of organic disease and with no history of pronounced illness.

"The Prime Etiological Factor of Glaucoma is Constitutional."

By Dr. S. O. Richey, Washington.

This paper, quoting from the Bowman Lecture, 1884, by Mr. Jonathan Hutchinson, the affections of the eye possibly having some connection with gout, among which is named glaucoma, elaborates the thought, shows the correspondence of the details of an attack of podagra and one of glaucoma in their clinical history, the anatomical similitude of the two regions, referring to the classes of individuals attacked by each and endeavors to explain certain differences. [? Editor]. The writer expressed in a cursory way in a discussion before the American Ophthalmological Society, some years ago, views of which this is a more complete presentation. He calls attention to Mr. Priestly Smith's theory, to the observation and experiences of others opposing it, and himself objects to Mr. Smith's as of too local and limited character. Reasoning from Schnabel's conclusion, increased tension is caused by too rapid infiltration, to which a *vis a tergo* is essential, as is found in the uric acid diathesis.

"Many manifestations of rheumatic gout are associated with chronic glaucoma, viz., enlarged or distorted joints, a peculiar senile pallor, or muddiness of the skin, periods of mental depression, and other symptoms attributable only to changes in the nervous system." The neurotic character of chronic glaucoma is argued, its origin thought to be the absorption of toxic substances from the intestinal tract the results of indigestion

for which reason, it is claimed, operation in chronic glaucoma is unreliable.

In case of chronic glaucoma, the writer advises control of the quantity and quality of food to the exactness of physical needs, the prompt excretion of improper intestinal products, the use of uric acid solvents (lithia and piperazin), strychnia and galvanism as the wise course.

He thinks that "in the hypothesis discussed, we find the true etiological factor of that most intractable of diseases, chronic glaucoma (that acute inflammatory glaucoma is a paroxysmal expression of the same affection) local irritation or a trauma, excites an attack of glaucoma only in the presence of the dyscrasia; that operation saves the eye during a paroxysm, that operation serves little purpose in chronic glaucoma, even when it does not, by irritation, precipitate a paroxysm, that chronic glaucoma is a neurosis, a progressive atrophy with the feature of inflammation with defective power, varied by periods of apparent rest. That correcting and controlling individual habits, especially in the character and amount of food taken will do more to preserve vision than operation, that there may be a possibility of aborting chronic glaucoma if the tendency to it be recognized at an early stage."

"The Full Correction of Myopia." By Dr. Edward Jackson, Philadelphia.

The results of such correction in 29 cases of patients under observation from 3 to 10 years was given. In but three was there any notable increase in the degree of myopia and these were hard students between the ages of 12 and 21 years, and under the full correction they had subsequently become stationary. It was hoped that the reporting of such results would do away with any timidity about ordering the proper concave glasses for constant use. The contraindications were presbyopia and an exceptional inability to use such lenses for near work, similar to the inability of some emmetropics to do much near work without convex lenses; lowered acuteness of vision

so that the perfect retinal images were not appreciated; habituation to large blurred images that made sharper images unpleasant in old myopes; and divergent squint established to secure more perfect monocular vision. The temporary inconvenience or pain experienced on first using strong lenses, might be tempered by temporary partial correction, or weak lenses for near work; but should not be regarded as a contraindication.

"Constant Correction of High Myopia." By Dr. George C. Harlan, Philadelphia.

The writer reported 12 cases in which full and constant correction of myopia of degrees varying from 4 to 16 diopters had been worn for periods of from five to seventeen years. The ages of the patients varied from 12 to 25 years. In some the fundus was normal, in some there were moderate myopic crescents and in others there were extensive choroidal changes. There was not the slightest loss in the acuteness of vision in any case. In eight, the myopia was stationary. In three there was a slight increase in myopia; from .50 to 1.50 D. In one only was there a considerable increase;—2.50 D. after constant correction for nine years, and this occurred chiefly during the first four years, during which there was an uncorrected hyperphoria. He considers excessive convergence without accommodation the most important factor in progressive myopia, and the restoration, so far as practicable, of the normal relation of these two functions, the most valuable therapeutic measure.

The degree of comfortable accommodation that exists at the time or can be acquired by practice with gradually increasing lenses, should be the chief guide in deciding upon the glasses to be used. The convergence will usually adapt itself when the accommodation is given its normal range, or if it does not, may be made to conform by prisms or tenotomy.

Complete correction of the optical defect with full restoration of the normal relation between accommodation and convergence is the ideal condition, and can usually be attained in

young subjects with fair acuteness of vision and full accommodative power.

When full correction is impracticable, it is better to sacrifice something in distant vision and wear constantly the strongest glasses with which comfortable reading is possible, than to use two pairs of glasses. The concave lens necessary to give full correction may be placed in front of the constant glasses occasionally by means of lorgnettes, or bifocal glasses may be worn.

"The General Form of the Human Cornea and Its Relation to the Refraction of the Eye and Visual Acuteness." By Swan M. Burnett, M.D., Washington.

The writer presented a table showing the measurements he had made with Javal's ophthalmometer, of the corneæ of 41 eyes. These measurements show the corneal curve expressed in dioptries of refraction at the usual axis and at intervals of 5° on either side in both principal meridians. These demonstrate the fact that the cornea gradually diminishes in curvature from the visual axis toward the periphery.

This diminution is much greater to the nasal side both in emmetropia and ametropia, sometime amounting to 4.5 D. The average, however, is 2 D. less at 15° on the nasal and .5 D. on the temporal side of the visual axis. The difference in the vertical meridian is less than that to the nasal side, but on the average greater than that to the temporal side. The practical inference is that the place of election in an iridectomy is the temporal side of the cornea.

He reaffirms the belief expressed in 1885, that the ophthalmometer is one of the best means we have at command for making out astigmatism, but that it can not be relied upon to the exclusion of other methods, for it gives no indication of the amount of lenticular astigmatism, the existence of which the instrument itself has been mainly instrumental in demonstrating.

"Some Incidental Phenomena of the Shadow Test." By Dr. Swan M. Burnett, Washington.

Dr. Burnett believes the shadow test to be, on the whole and for the generality of cases, a means of testing refraction reliable to within 0.5 D. or 0.75 D. He has examined a certain number of cases, however, in which the findings of skiascopy and by the test glasses did not coincide. In those instances he has noted a play of shadows, within the illuminated area which moves across the pupillary space very similar to what is observed in conical cornea. He has measured the corneæ of such eyes carefully with the ophthalmometer of Javal and Placido's disk and has not found them more irregular than eyes which are normal and present no such internal shadows.

The phenomenon is due to some interference in the regular refraction of the light in its outward passage from the fundus and must be found in the corneal substance, (not sufficient to produce a discoverable opacity) in the lens surface or the lens substance. Of the exact nature of this irregularity we are still ignorant.

He has found the visual acuteness in such cases to be below the normal in all cases in which the internal shadows were at all pronounced. In some instances which were cited the shadow-tests give reverse movements with minus glasses when plus glasses were required for lost vision, the examination being made under a mydriatic.

"The Law of Symmetry of Our Eyes as Manifested in the Direction of their Meridians; Its Rules and Its Exceptions." By Dr. Hermann Knapp, New York.

There is a double symmetry in the human visual apparatus:

1. Each eye can be split by a horizontal section into a superior and an inferior half.
2. One eye, as a whole, is symmetrical to its fellow with regard to the median line of the body.

Dr. Knapp discussed only the latter kind, and confines himself to the direction of the principal meridians in one eye compared with that of its fellow. He based his conclusions on the examinations of 1,000 successive cases of astigmatism (10% of his private eye patients during the last three years and nine months) for whom he has prescribed glasses, and who have worn them with more or less satisfaction. The result was as follows. The meridian of strongest refraction, shortest radius of curvature, was:

	PER CENT.
<i>A.</i> —Symmetrically placed in both eyes in	84
<i>viz.</i> 1. Vertical in	60.5
2. Horizontal in	11
3. Diagonal, 45° , in	4.3
<i>i.e.</i> a. Upper end of both on nasal side	2.7
b. Upper end of both on temporal side	1.6
4. Intermediate, <i>i.e.</i> , between vertical and horizontal, omitting the diagonal direction	8.2
a. Upper end of both on nasal side	4.9
b. Upper end of both on temporal side	3.3
<i>B.</i> —Unsymmetrically placed in both eyes	16
1. Strongest meridians intermediate:	
a. Both nasally deflected (upper end on nasal side)	1.8
b. Both temporally deflected	2.1
2. Strongest meridian vertical in one, horizontal in the other eye	1.3
3. Strongest meridian vertical in one eye,	
a. Nasally deflected in the other	3.3
b. Temporally deflected in the other	3.9
4. Strongest meridian horizontal in one eye,	
a. Nasally deflected in the other	1.2
b. Horizontally deflected in the other	1.6
5. Strongest meridian nasally deflected in one eye, temporally in the other	0.8

This table shows a high degree of symmetry in our pair of eyes, viz. 84%. The dominating direction in the vertical, 60%; next comes the horizontal with 11%, then the diagonal with 4.3%.

If both meridians are vertical they are geometrically parallel, but they remain symmetrical just as if both are horizontal. Parallel direction in the intermediate position, for instance, 35° of temporal deflection in one eye, and 35° of nasal deflection in the other occurs but very rarely. There was no instance of it in this whole series.

The symmetry of our eyes may give us many hints in the selection of cylindrical glasses. As symmetry is the rule, we should try to approach this rule also in the 16% of exceptional cases as near as this is compatible with a good correction of the visual acuteness. In conclusion Dr. Knapp recommends that in our prescription of glasses, the complete or incomplete symmetry should be at once apparent; saying, for instance, so and so many degrees of nasal deflection, viz., 10m, instead of 80° O.S. and 100° O.D. Furthermore, he proposes a classification of the varieties of astigmatism based on the direction of the strongest meridian, viz., vertical, horizontal and intermediate or oblique astigmatism, where a deflection of 45° may be called diagonal. The oblique variety has to be subdivided into nasally oblique (or simply nasal) and temporally oblique (or simply temporal).

Dr. George C. Harlan, Philadelphia, read a paper giving "Statistics of Direction of the Principal Meridians of the Eye," the results obtained being very similar to those presented by Dr. Knapp.

"The Clinical Value of Repeated Careful Correction of Manifest Refractive Error in Plastic Iritis." By Dr. Charles A. Oliver, Philadelphia.

The paper was based upon a careful study of forty suitable cases, extending over a period of five years. The plan of study was not only limited to the ordinary subjective method

of lens testing, but was accomplished by some of the more certain of the various objective plans, such as retinoscopy, ophthalmoscopy (both by the direct and the indirect methods), the fundus image test, and lastly by ophthalmometry as a method of control; Thomson's ametrometer and the chromatic aberration test being used at times.

The following conclusions were presented:

1. In nearly every case of iritis, especially of the plastic forms, there is a period even after full pupillary dilatation has been seemingly artificially obtained, during which owing to the persistence of inflammatory changes in the uveal tract as so well expressed by the clinical evidences of ciliary spasm, etc., graduated instillations of mydriatics should be employed; the duration and gravity of this period being not accurately measured and determined by the systematic and repeated estimation of the varying manifest errors of refraction.

2. Whilst it is true that during this stage in nearly every case of iritis, ophthalmometric, or rather keratometric study, seems to show at times that there are bizarre and curious changes of corneal curvature, yet it must be conceded from the additional findings of other optometric methods, that the bulk of the ametropic change in such cases is due to the perversion of the lens action from what Koller terms "spastic accommodation," as the result of ciliary irritation and inflammation.

3. In nearly every case of iritis the duration of this stage can be promptly shortened by the judicious and ready use of some quick and powerful intraocular muscular paralyzant; the character of the necessary form of the drug and its amount at the time in every instance being judged by the amount of manifest refractive error found at that time.

4. In some few such cases of iritis, however, during the acme of the attacks, especially if the case be pronounced in type and stubborn in character, the higher grades of the manifest refractive error seem to obstinately persist with but little variation in amount, and to defy for a long time reasonable local and general measures.

5. In some few cases of incipient iritis, where chronic spasm of the ciliary muscle seems to present itself, or pupillary contraction repeatedly persists, local muscle paralysis as evidenced by a relative decrease of the refractive error is often quickly obtainable by a prompt and more energetic employment of some of the more powerful and appropriate local and general remedies.

6. Consequently, the careful systematic estimation of the manifest error of refraction found during attacks of iritis is of great value in the rational and scientific treatment of the disease, offering itself as not only a means by which the general prognosis of the affection can be made more certain from time to time during its progress, but permitting itself to serve as a measure or guide, as it were, by which the attacks may be more properly and more understandingly treated, and their duration shortened by the judicious and intelligent use of appropriated drugs, thus giving a better opportunity for lessening the chances of harmful and permanent after-changes to one of the most important, and yet, one of the most susceptible organs of the ocular apparatus.

"Some Tenotomies of Recti Muscles for Insufficiencies." By Oren D. Pomeroy, New York.

CASE I.—Mr. H. T. G., æt. 53, has been wearing a spherico-cylindrical correction for several years without relieving headache and a difficulty in looking down. Has hyperphoria $3^{\circ}+$ and exophoria 2° . Divided the superior rectus of right side with diplopia and an over-effect of 2° resulted, which continued for a week; equilibrium was established in three weeks and the asthenopic symptoms were relieved.

CASE II.—B. B., æt. 16, has $+5$ D. of hypermetropia in each eye with a tendency to strabismus. Correction affords partial relief. Exophoria 16° . Tenotomy of right internus with much over-effect; corrected by a suture. Two weeks afterward the effect of the first operation was diminished and the left internus was divided. After two weeks the balance was

nearly normal. Rather weak instinct for binocular vision; one eye not quite perfect vision; resembled a case of convergent strabismus.

CASE III.—Miss C., æt. 45, overworked schoolteacher. Has headache, pain in eyeballs during near work. H. 1.25 D. in each eye; some relief from glasses. Exophoria at distance 18° . External rectus tendon divided very thoroughly. For a time some relief of symptoms. Recommended division of left externus. Case was not followed up, but two years afterward patient admitted benefit from operation.

CASE IV.—Annie T., æt. 24, has headache and pain in the eyes when sewing or reading. Cyl. of .75 D. in each eye tried without relief. Exophoria of 6° or 7° before and after glasses. The internus of right side, and after a few days that of the left was divided, but the exophoria returned as at first. Six months later right externus was advanced. This being insufficient, the left was also advanced after ten days. The effect was temporary and a prism of 2° base inward was added to the glasses and worn for a month without benefit. Exophoria was now from 5° to 9° at the far point, adduction 32° , abduction 3° . Complete division of right internal rectus and 8° of over-effect resulted and diplopia; next day binocular single vision. A few weeks later she showed at times orthophoria, some exophoria, diplopia, occasionally headaches, and she was as badly off as before.

CASE V.—Martha P., æt. 20, has headache when using her eyes. V. = $\frac{20}{XL}$ in each eye. Myopia —5 D. Exophoria 12° . June 18, 1890, left externus was divided with correction of the insufficiency. In September the asthenopic symptoms were relieved, although some exophoria remained. It was not certain whether tenotomy or glasses relieved.

CASE VI.—R. R., æt. 18, student. Headache in temple and occiput most of the time when studying. Emmetropia (homatropine) exophoria 16° at distance, hyperphoria 4° . Sept. 22, external rectus was divided, which corrected the exophoria. Three days after operation exophoria was 5° , but no asthenopia. Returned to his work. March 7, 12° exophoria,

but no asthenopic symptoms. Uses the eyes extensively. March 16, there was 10° of exophoria and the left externus was divided, resulting in over-effect which was corrected by a suture. March 19, exophoria 5° . If he looks sharply to either side has diplopia. No more hyperphoria. Asthenopia completely relieved.

CASE VII.—Sarah I., æt. 28. June 8, 1888. She has headache and inability to use eyes. Hypermetropia $+1.50$ D. under atropia; afterward $+ .75$. Glasses were worn for two months without relief. There was exophoria of 3° at the far point. Sept. 26-28, the externus was divided with over-effect, corrected by a suture. Oct. 15, exophoria 4° . Oct. 31, tenotomy of right externus. Nov. 5, orthophoria. Headache diminished.

CASE VIII.—Miss T., æt 17, has -3 D. myopia; has used partial correction without comfort. Some marginal blepharitis. Has exophoria of 5° . Left rectus was divided, an over effect was produced and diplopia for 3 or 4 days. After 10 days there was 3° of exophoria, but asthenopic symptoms relieved.

CASE IX.—Mary B., æt. 18, headache, eyes emmetropic, exophoria 3° . The right externus divided, producing over effect of 18° , corrected by a suture. In two days there was orthophoria. Headache relieved and eyes can be used with comfort.

CASE X.—Alice H., æt. 22, headache and pain in eyes when sewing or reading. The externus had been divided by another surgeon with relief, lasting six months. She is wearing a spherico-cylinder correction. She has exophoria of 6° . The externus was divided with 3° over-effect, but in three days there was orthophoria with relief of symptoms which has continued for one year.

CASE XI.—Mrs. G., æt. 38, has a myopia of -3 D. and she has worn the correction for 4 years, but still has headache and pain in the eyeballs, vertigo, nausea, and inability to use the eyes long at a time. Exophoria of 4° at the far point. Left externus was divided, with production of orthophoria. After

one month there was 2° exophoria, but the asthenopia has disappeared.

CASE XII.—H. G., æt. 65, is wearing + glasses but complains of occasional diplopia. Has exophoria of 10° and hyperphoria of 5° . Nov. 19, 1889, did tenotomy of left externus and relieved half of the exophoria. The next day there was orthophoria and no more diplopia.

CASE XIII.—Maggie C. æt. 23, sees double, having compound hypermetropic astigmatism. After wearing proper glasses for some time without relief and it being found that there was exophoria and hyperphoria of from 3° to 5° . The left superior rectus was divided, nearly correcting the trouble. In twenty days, the internus of the right side was divided, resulting in orthophoria and no more trouble with diplopia.

CASE XIV.—Mr. L., æt. 35 druggist, has diplopia and great pain on using the eyes, although he has been wearing properly fitting spherido-cylindrical glasses. Nov. 27, 1888, he had exophoria from 3° to 18° and a hyperphoria of 9° . The right externus was divided freely and for several days he had vertical diplopia. In March, he was completely relieved. In Dec. he had exophoria of 7° and no hyperphoria. He uses the eyes excessively and has no inconvenience of any sort.

In the face of the preceeding facts the author stated that most of the cases of insufficiency that he had met with had been relieved by correcting the ametropia

In dividing the tendon in some instances an operation has been made in the center and a small hook passed in dividing successively each half, this is a difficult procedure and not necessary. Ordinarily the conjunctiva is divided as little as possible and the tendon divided at its insertion, the patient is then tested by prisms and if more effect is desired, more dissecting is done. It is difficult to tell by inspection whether or not all the tendon has been divided. A little over effect is usually desired, and if considerable over-effect is obtained a suture corrects it.

In many of these cases where all the muscles are weak, the

patients have had diplopia when looking toward the divided tendon, but this has been unimportant.

"Prominent Symptoms of Hyperphoria." By H. F. Hansell, Philadelphia.

This paper was based on a study of 13 cases. The symptoms given included only those positively traceable to the hyperphoria, as demonstrated by their disappearance on the cure of the affection. In 10 of the cases the symptoms were purely local. Photophobia of moderate degree was present in 5 cases. Pain in the eyeball constant, or induced by reading was prominent in all cases.

Reflex symptoms. Six cases suffered with vertigo and dizziness. Two cases were the subjects of violent dyspepsia. In 4 cases the most prominent symptoms were excessive nervousness, irritability of temper and at times mental confusion.

"Contribution to the Subject of Intracranial Lesions with Defects in the Visual Fields.—Five cases with Autopsies." By Charles Stedman Bull, M.D., of New York.

The first case was that of a lady aged 50 years who had no trouble with the sight until four years before coming under observation, when she suffered a severe and sudden mental shock which caused a series of convulsions ending in a condition of profound nervous prostration. Then followed severe neuralgia coming on every three weeks and lasting for more than a year. The first ocular symptom was night blindness in one eye, with progressive amblyopia. One year later, the other eye became affected in the same way. Headaches then came on, boring in character and located at the vertex, but subsequently becoming continuous and confined to the occipital region. There was a large irregular central scotoma in the left eye for form and color, and a smaller scotoma in the right eye. The fundus of the right eye was but little affected but in the left eye, there was a neuro-retinitis in the stage of decline,

and beginning atrophy of the optic nerve. The patient lived four years with steadily failing vision. During the last year, she had repeated attacks of unilateral convulsions, became wildly delirious and died in a violent general convulsion. The autopsy showed extensive pachy-meningitis of convexity of left anterior lobe, some patches over right anterior lobe and one large patch over right parietal lobe. All the arteries at the base of the brain were thickened and their lumen narrowed.

The second case was a young man, aged 24 years who had suffered from headache for more than a year, at first slight and transient but increasing in severity and intensity. Six months later, appeared muscular twitchings in upper extremities and face, and attacks of vertigo. The vision of both eyes became affected. In one of these attacks, he developed general convulsions and fell a distance of thirty feet striking on his back, but the fall apparently produced no evil result. There was concentric narrowing of the field of both eyes which steadily increased and the vision slowly failed. The optic discs which were at first hyperæmic, became pale and atrophied. About six months after the first convulsion, he had two violent convulsions rapidly succeeding each other, which proved to be the last. He became very irritable, grew stupid and gradually sank into profound coma in which he died. The autopsy revealed a large tumor involving the optic chiasm, both optic nerves and the hypophysis, which on examination proved to be a small-cell sarcoma.

The third case was a gentleman aged 37 years, who had suffered from severe headaches for about nine months in the left parietal and occipital region. Two months later, there occurred a loss of vision in the right half of each field. Six weeks before coming under observation, he suddenly lost the sense of smell. Examination showed a vision of $\frac{20}{40}$ in each eye and a bilateral right hemianopsia with concentric limitation of the remaining fields. This patient had had a chancre twelve years before. The intracranial lesion was believed to be a gumma and located in the cuneus. In spite of treatment,

there was a steady failure of vision, and he began to have muscular twitchings in face and hands. He gradually became stupid, then comatose and he finally died fourteen months after the first appearance of the headache. At the autopsy an olive shaped tumor was found in the cuneus on the left side close to the median line. This proved to be a small-cell sarcoma.

The fourth case was a lady aged 72 years, who had suffered with headaches for more than a year. Six months before coming under observation, she awoke with severe pain in the head and total blindness in the left eye. There was confusion of ideas, numbness of the right arm and leg and thickness of speech. An examination showed slight ptosis of both upper lids, speech thick and slow, tongue pointing to the right side, vision ²⁰ LX, slight lenticular opacities and bilateral left hemianopsia. The ophthalmoscopic examination was negative. It was thought probable that the patient had a thrombosis and subsequent rupture of the middle cerebral artery on the left side. The lady lived for twenty months, during which time the vision failed but the fields remained unchanged. One morning she was found unconscious and died three days later. The autopsy showed a patch of softening in the left anterior lobe and in a branch of the middle cerebral artery, running through it was an old plug which completely obliterated it. There was a recent rupture of a branch of the left middle cerebral artery and a large clot of blood in the middle lobe of the brain close to the Sylvian fissure. All the arteries of the brain were diseased. At the base of the brain on the right side, overlying and pressing upon the right optic track was a tumor, the size of a hazelnut, situated just in front of the corpus geniculatum laterale. This proved to be a small-cell sarcoma.

The fifth case was a gentleman, æt. 35, who had suffered from severe headache for three years, beginning in the frontal region, but gradually extending all over the head. At first intermittent, but later constant. Occasional attacks of nausea and vertigo. Four years before he had received a violent blow on the left parietal region which caused bleeding from the left

ear and rapidly increasing deafness. Nine months before coming under observation, he began to see double. Six weeks after he came under observation, partial left hemianæsthesia appeared. There was paresis of both external recti muscles. Vision in the right eye was $\frac{20}{6}$, in the left eye $\frac{20}{1}$. There was marked papillitis with numerous hæmorrhages. There was homonymous diplopia for all distances, irregular central scotoma for all colors, vertigo very marked with a tendency to rotate to the right side. Diagnosis of cerebellar tumor was made. Towards the end he became nearly blind and died in profound coma. The autopsy revealed a globular tumor in the right lobe of the cerebellum, close to the peduncle. This proved to be a glio-sarcoma.

"The Eye of the Negro." By Dr. Charles W. Kollock, Charleston.

In presenting the paper, Dr. Kollock said that he had no wonderful discoveries to make known, but merely desired to bring before the Society some points that had interested him during a somewhat extensive practice among these people. Attention was called to the fact that the negro is fast losing his identity as far as purity of blood is concerned and that the eye of the negro has deteriorated very much since the days of slavery. Prior to this period the negroes were carefully looked after by their masters and being essentially an agricultural people, there was little or no opportunity for bringing on eye-strain. The testimony of older physicians have proved that syphilis and other wasting diseases were not common among them and that iritis and keratitis, which are now so commonly seen, were of rare occurrence. During the war and immediately after it was over, they contracted syphilis principally from the troops who were encamped in their midst, and now it is scarcely an exaggeration to say that when you see a negro, you see a case of syphilis. To this disease, and their very careless mode of living, he thought was due their great susceptibility to corneal inflammation which was now

causing great destruction of vision. Among the older negroes and ex-slaves, it had been noted that nebulous corneæ, iritic adhesions and eyes lost from ophthalmia neonatorum were very unusual, but with the younger and post-bellum it was not only of every day occurrence, but constantly increasing. Cataract and glaucoma were as commonly observed in the negro as in the white. It had been said by a number of observers that trachoma was exceedingly rare among the negroes, and while he agreed that it was infrequently seen, still it was equally unusual among the whites in Charleston and throughout South Carolina. The most severe cases had occurred in negroes. He mentioned that as the South was one into which few immigrants had come, perhaps the worst forms of granular conjunctivitis had not been introduced. Xerosis conjunctivæ was a condition of the eyes that had been seen exclusively in the eye of the negro and especially in children. It was frequently accompanied by hemeralopia but not invariably and was essentially a condition which was due to a low state of health. A case had been recently seen in an adult male who had complained only of night-blindness. The peculiar conjunctival changes were present, but there was no corneal lesion. The ophthalmoscope showed a slightly hazy papilla but no further intra-ocular changes. There was marked concentric contraction of the visual fields, but no scotoma and the color perception was fairly good. It seemed very strange that this affection was not found among the whites, many of whom lived in the same localities and under similar influences as the negro.

The refraction of the negro eye was exceedingly interesting as it was undoubtedly undergoing a change. He believed that the eye of the pure blooded negro who could not read was emmetropic, or slightly hyperopic and never myopic; that among the educated pure bloods, errors of refraction were becoming more frequent, and that with the mulattoes, ametropia was almost, if not quite as common, as among the whites. Of sixty cases of blacks and mulattoes recently examined for the most part with their eyes under the influence of atropia, or

homatropia, eleven were blacks and forty-nine were mulattoes. Of the eleven blacks seven were males and four females. Two of this number were myopic, two were hyperopic, and three were emmetropic. The forty-nine mulattoes were seven males and forty-two females. Three of the males were myopic and four were hyperopic. Nine of the females were myopic, thirty were hyperopic and one was emetropic.

"Cases of Monocular Amblyopia in Members of the Same Family." By Dr. Charles W. Kollock, Charleston.

Two sisters and two brothers of the same family were amblyopic in the left eyes.

CASE I.—Female, æt. 47. Vision in left eye, $\frac{15}{LXX}$; left eye, $\frac{1}{CC}$; with +1.50D. Right eye was $\frac{25}{XV}$; left eye not improved by any glass. Ophthalmoscopic examination showed hypermetropia between 3 and 4 D., but nothing else to account for the amblyopia.

CASE II.—Female, æt. 27. Vision was never good, but always better in the right eye. Right, $\frac{15}{LXX}$; left, large objects. Neither eye was improved by any glass. The ophthalmoscope showed disseminated choroiditis and there were other physical signs of inherited syphilis to be seen externally. She was said to have been borne with sores on her body and never been strong and healthy.

CASE III.—Male, æt. 30. He had been paralyzed by an attack of brain syphilis (acquired). Right eye, $\frac{15}{XX}$; left, large objects. No glass improved either eye. The ophthalmoscope showed the right disc slightly hazy, but no inflammation. In the left was a coloboma of the nerve measuring 12 D. in depth. There were no signs of inflammation.

CASE IV.—Male, æt. 50. Vision in right, $\frac{15}{CC}$; left, $\frac{6}{CC}$. Right, with +2.25 was $\frac{15}{XV}$; left, with +3.50 was $\frac{15}{XV}$. The ophthalmoscope showed nothing beyond the hyperopia. In only one of the four cases were there any signs of inherited syphilis. Two children of Case I were also examined and exhibited conditions in the left eye not present in the right. The

daughter, æt. 28, had slight dilatation of the left pupil for which no cause could be assigned and which still remains. Under homatropine both eyes showed hyperopia of 1 D., and vision, $\frac{15}{xv}$. The son, æt. 22, was examined under homatropine. Right, with +0.50 D. was $\frac{15}{xv}$; left, with +0.50 \bigcirc +0.50 cyl. 60° was $\frac{15}{xv}$.

"On the Frequency of Posterior Capsular Opacities at the Place of Attachment of the Hyaloid Artery." By Dr. W. F. Mittendorf, New York.

The paper calls attention to the frequency of small, round, lenticular opacities which the writer believes are the remains of the foetal hyaline artery, or mark the attachment of the artery to the posterior lens capsule. After observing two cases of remaining hyaline artery, the author studied every eye with a strong lens and the ophthalmoscope and found that in 1,884 persons these opacities were observed in 44 cases, which is a little more than 2% of all persons examined. They were observed more frequently in the right eye than in the left, and oftener in the male than in the female, not infrequently they are seen in both eyes of the same patient. They vary in size from a dot as small as the point of a pin to that of the size of a poppy seed, and frequently a magnifying power of a lens of 5 or 6 diopeters is necessary to see them. The conclusions arrived at are as follows:

That these opacities indicate the point of attachment of the foetal hyaline artery to the posterior capsule of the lens and that probably the nutrition of the capsule is sufficiently interfered with at the time of the absorption of the artery to lead to the cloudiness at the point of attachment.

That the location of the spot on the capsule is almost invariably a little to the inner side of the posterior pole of the lens.

That the spots are usually well defined and only in one out of fifty cases several radiating lines probably corresponding to branches of the hyaline artery were visible.

That in no case was there any connection of the spots with

other opacities of the lens which were seen to exist at the same time.

That these spots are therefore non-progressive and do not lead to any impairment of vision, nor are they apt to lead to any refractive or other changes in the eyeball.

That it is only in very exceptional cases that they produce subjective symptoms, the patient usually not being aware of their existence.

That their occurrence is by no means rare as they have been found to be present in 2.3% of a large number of eyes, and as they are congenital they are found equally often in old and young people, and that they appeared to be oftener met with in the male than in the female which he considers accidental as the number of eyes seen is hardly large enough to establish this point. Their greater frequency in the right eye is probably likewise accidental for he was at a loss to explain why the right eye should be more frequently the seat of these opacities except that it is further from the heart, and nutrition perhaps a little more difficult and the process of absorption on this account slower and less complete.

Dr. Oren D. Pomeroy, New York, presented a paper on "Some Cataract Extractions With and Without Iridectomy," which was read by title.

"Preparations of the Nerves of the Cornea." By Dr. Carl Koller, New York.

Ehrlich's method of staining the peripheral nerves by the injection of a saturated solution of methylene blue into the vessels of a recently killed animal was made use of. This colors the nerves of the cornea in a beautiful manner, but has the disadvantage of being only temporary and does not permit of the making of preparations. The speaker had for some time been experimenting with the object of making the staining permanent, and had to a certain extent succeeded. As the method was not yet perfect, it was not described, but a number of preparations showing the corneal nerves was exhibited.

"Scleral Puncture in Detachment of the Retina." By Dr. T. Y. Sutphen, Newark, N. J.

The author describes the results obtained in two cases, the first successful in restoring useful vision, the second resulting in a slight improvement.

CASE I.—H. M. æt. 50, came under observation July 30, 1891. In the right eye was a scar upon the cornea, a tear in the iris directly opposite, and the pupillary iris space was partly occupied by the shrunken lens, the traumatism dating back ten years, and resulting from an explosion of giant powder. With a convex lens of 9. D. his vision was $20/_{cc}$, but the use of this was very troublesome to him. In the left eye, upon the sclerotic was a small dark spot, evidently a powder stain, located about two lines to the temporal side of the margin. Directly beneath this was found a large detachment of the retina. The temporal edge of the lens was gray, the vitreous was quite clear. The man had first noticed trouble with this eye two weeks before as a dark cloud before his vision, his sight previous to that being good. The patient was put to bed and treated with pilocarpine injections, and later potassium iodide. The detachment gradually became total. Scleral puncture was resorted to December 1, 1891. There was no reaction, a slight œdema of the conjunctiva lasted three or four days. Material improvement was noticed from the second day. The patient was kept upon his back 3 weeks and left the hospital Jan. 15, 1892, with his retina *in situ* and vision $20/_{XL}$, without glasses, this being good, considering the fact that the opacity in the lens has increased during the time of detachment. The sight still remains good.

CASE II.—Mrs. S., æt. 48, a myope of moderate degree, sought treatment Dec. 17, 1891. Her trouble was a cloudiness before both eyes, which had existed for a long time, but which had increased greatly in the right eye during the previous week or two. Examination showed a cloudy vitreous in each eye, the right one containing large floating opacities. Vision, right eye, fingers at 18 feet; left eye $20/_{L}$, with correcting

glasses. Under iodide of potassium the right improved considerably until Feb. 3, 1892, when she returned greatly alarmed about a dark cloud before her right eye. This proved to be a detachment of the retina on the nasal side. Treatment in bed and medication did not arrest the detachment, which soon became total. Scleral puncture was made May 18, 1892. At first there were patches of acute vision in the field, the patient being able to recognize objects across the room distinctly in certain directions. The retina had become reappplied in certain portions. This peculiarity soon gave place to a more general haziness of vision. The subsequent care of the patient was the same as in the other case. Upon examination of the eye a week ago, the retina was found in its normal position at its upper half, detached in the lower, vitreous cloudy, counts fingers at six feet in lower half of the field.

In both cases the operation was made under cocaine and with antiseptic care, using a solution of bichloride 1:12000. The puncture was made with a narrow Græfe knife, near the equator of the globe, between the insertion of the external and inferior recti muscles. With the globe well rotated upward and inward, the puncture was made directly through the conjunctiva, while the return of the globe to its normal position really converted the opening in the sclerotic into a sub-conjunctival one. Possibly had a large puncture been made in the second case, the result might have been better, but the conditions of the two cases were quite dissimilar.

“Orbital Cellulitis.” By Dr. E. E. Holt, Portland, Me.

The inflammation spread to the temporal region, thence to the neck, interfering with deglutition, extending to the brain and producing death. A brief report of four similar cases was also given.

“Recurrent Bilateral Inflammation of the Capsule of Tenon, in Connection with Mercurial Poisoning.” By Dr. Chas. J. Kipp, Newark.

The first attack resulted from an injury, but the attacks continued to recur. The patient was employed in an incandescent electric lamp manufactory and had become poisoned from the mercury used in his work. The recurrences continued until he gave up this work, but since leaving it (a year and a half) he has had no attack.

"Pulsating Exophthalmus." By Dr. R. A. Reeve, Toronto, Canada.

The case was one in which the pulsating exophthalmus had followed trauma. It was thought that there was a lesion of the internal carotid allowing the blood to enter the cavernous sinus. Pressure to the carotid proved of no avail. A year ago the right common carotid was tied. Pulsation and bruit ceased for a few hours and then returned. Some months later finding that compression of the left common carotid stopped the pulsation and bruit, this vessel was tied, but the pulsation still persists. There is no pulsation in the right common carotid above the seat of ligation. Pressure upon the right external carotid stops the pulsation and the bruit absolutely.

"Sub-Conjunctival Application of Cocaine." By Dr. Carl Koller, New York.

The instillation of cocaine has only a superficial effect, but by beginning the instillation half an hour before operation, the deeper tissues are sometimes rendered anæsthetic, but not always. By the sub-conjunctival method, the deeper tissues are rendered anæsthetic. After making the conjunctiva anæsthetic by a 4% solution, a few drops of a 1% solution are injected beneath the conjunctiva. Tenotomy can then be done without the slightest pain. Cataract operations and iridectomies can be done without the slightest pain by rendering the conjunctiva anæsthetic and then injecting three or four drops of a sterilized 4% solution beneath the conjunctiva and waiting ten minutes.

Dr. Carl Koller, New York, read a paper on "The Form of the Images in Astigmatic Eyes."

Dr. Chas. J. Kipp, Newark, N. J., reported a case of Gumma of the Ciliary Body, and exhibited the specimen.

Dr. F. Buller, Montreal, Can., exhibited an improved Trial Frame.

Dr. J. A. Andrews, New York, showed an Apparatus for Washing out Cortical Matter. He also exhibited drawings of four cases of Gumma of the Iris.

Dr. Lucien Howe, Buffalo, demonstrated a Pocket Ophthalmoscope.

Dr. R. A. Reeve, Toronto, described a Modification of the Rotary Prism Test.

Dr. John Green, St. Louis, reported a case of Hyaline Bodies in the Nerve Head.

The following officers were elected:

President—Dr. Hashet Derby, Boston.

Vice-President—Dr. George C. Harlan, Philadelphia.

Corresponding Secretary—Dr. J. S. Prout, Brooklyn.

Recording Secretary—Dr. Samuel B. St. John, Hartford.

Delegate to the Executive Committee, Congress of American Physicians and Surgeons—Dr. John Green, St Louis.

Alternate—Dr. D. B. St. John, Roosa.

The following were elected to membership: Dr. J. A. White, Richmond, Va.; Dr. Walter B. Johnson, Patterson, N. J.; Dr. G. W. Hale, Nashville, Tenn., and Dr. R. F. Randolph, Baltimore, Md.

The next meeting will be held at New London, Conn., 3d Wednesday of July, 1893.

Adjourned.

SELECTIONS.

NOTES ON SPASM OF THE ACCOMMODATION.

BY W. H. BATES, M.D.

CASE I.—A business man aged thirty-six, several years ago complained that his vision for distant objects had failed. He could not recognize his friends across the street. Large signs could not be read until he was very near. He felt that he had become near-sighted. The cause of his poor vision he ascribed to continued writing by a poor light. After stopping the work which strained his eyes, he recovered without other treatment. Now his vision is perfect without glasses.

CASE II.—A lady, aged thirty-three, has had poor vision for a number of years. To obtain normal vision she requires — 1 D. S. After treatment of the eyelids for one week vision improved from $\frac{20}{XL}$ to almost normal, $\frac{20}{XX}$ —, without glasses.

CASE III.—An oculist, aged thirty, reports that ten years ago he was wearing — 1.5 D. S. to obtain good vision. Under atropine at this time he was still myopic. Several years ago, after an attack of measles, vision normal, $\frac{20}{XX}$, without glasses. With the return of his general health the spasm came back and he was compelled to use — 1.5 D. S. to obtain vision of $\frac{20}{XX}$. Atropine was used for several weeks until constitutional symptoms of atropine poisoning were produced. Vision under atropine $\frac{20}{LXX}$ with — 1.5 D. S. vision normal, $\frac{20}{XX}$.

Later, without the use of atropine, he finds that there are times when his vision is normal, $\frac{20}{XX}$, without glasses.

It is a curious fact that the spasm relaxed during ill health. The impression is prevalent among many authorities that ill health at least aggravates if it does not act as a factor in the cause of myopia. The following case also shows that the spasm relaxed during ill health:

CASE IV.—A medical student, aged twenty-one has been wearing for four years a minus fourteen-inch glass with no discomfort, most of the time at a German gymnasium. The glasses were prescribed by a prominent oculist who used atropine for one week and made several tests. Lately, he being run down his eyes have not been entirely comfortable. An examination without atropine showed a myopia of one half the degree of the glass he is wearing. Under atropine two days, patient is not myopic. I am indebted to Dr. H. Seabrook for the notes of this case.

CASE V.—An artist, aged eighteen, gave the history of myopia after an attack of measles when seven years old. Under atropine five days, vision $\frac{20}{c}$, w. — 1.5 D. S. = $\frac{20}{xx}$. These glasses were prescribed for constant use. Several months later vision the same with and without the glasses as when under atropine. After remaining five minutes in a dark room with the eyes closed, rubbing the skin of the forehead a few times with the hand, and then testing the vision, it was found that the patient had temporary vision of $\frac{20}{xv}$ without glasses. The cause of the spasm in this case seemed to be due to the effect of light.

In the following case also there seemed to be spasm from the effect of light:

CASE VI.—A physician, aged thirty-five, has a vision of $\frac{20}{cc}$ in the right eye; the left eye has normal vision. After remaining in a dark room for a few moments, the vision of the right eye is normal, $\frac{20}{xx}$, for a short time only. Under atropine one week, vision of the right eye $\frac{20}{cc}$, with a minus twenty inches glass, vision normal, $\frac{20}{xx}$. After remaining in a dark room for a few moments and then testing the vision of the right eye in the light, vision is normal, $\frac{20}{xx}$, for a short time only.

When treatment can relieve this sensitiveness of the eyes to the light, the spasm is sometimes relieved also, as in the following case:

CASE VII.—Mrs. H., aged twenty-three, is wearing $-\frac{1}{LX}$. She has chronic conjunctivitis slight, with considerable pain in the eyes from the effect of light, especially gas-light. Treatment of the lids relieved the intolerance of light, and the vision became normal at the same time without glasses.

CASE VIII.—A stenographer, aged thirty, wore glasses to see at a distance.

April 29, 1888.—Vision of the right eye $\frac{20}{LXX}$, with $-\frac{1}{XX}$ vision normal. Vision of the left eye $\frac{20}{LXX} +$, and requires some glass to obtain normal vision. Cocaine applied to the mucous membrane of the left nostril improved the vision of the left eye. Cocaine in the right nostril did not improve the vision of the right eye to an appreciable degree. A number of operations were performed for the removal of nasal hypertrophies, etc.

May 15, 1888.—Vision of the right eye not improved. Vision of the left eye normal, $\frac{20}{XX}$, without glasses.

June 1, 1891.—Three years later the left eye was still normal, the right eye still myopic.

CASE IX.—Mr. M., aged twenty, complains of being nearsighted. He has been tested three times under atropine.

April 5, 1888.—After using atropine for a week, pupils widely dilated, throat dry, cheeks flushed. Vision of both eyes $\frac{20}{LXX}$, with -2 D. S. vision normal. Ophthalmoscopic examination showed myopia. Cocaine was applied to the right inferior turbinated and septum of the nose, when the vision at once became nearly normal. At the end of fifteen minutes the vision returned to $\frac{20}{LXX}$, what it was before the application of the cocaine in the right nostril. The vision of the left eye was not materially changed by the application of the cocaine in the right nostril. A sharp projecting point on the right septum was removed with the saw after cocaine was applied. Vision of the right eye became normal, $\frac{20}{XX}$, and remained normal.

July 15, 1888.—Three months later the vision of the right

eye is still normal, $^{20}/_{XX}$. The vision of the left eye is unchanged, $^{20}/_{LXX}$. Cocaine in the left nostril improves the vision of the left eye to the normal for a few minutes only.

CASE X.—A sailor, aged thirty-five, complained of recent failure of the vision. He required a minus twenty-inch glass to give him normal sight. Treatment for several weeks of the eyelids and nose with nitrate of silver and yellow oxide-of-mercury ointment improved the vision from $^{20}/_C$ to the normal, $^{20}/_{XX}$, without glasses.

CASE XI.—A colored girl, aged twelve, an epileptic, had always been near-sighted(?). Atropine was used in both eyes for a week. At this time, vision of both eyes $^{20}/_{CC}$ — ; with a minus ten-inch glass the vision was normal. With the ophthalmoscope the fundus could be seen best with this glass, but there were moments when the light streak on the vessels could be seen with a far-sighted glass, convex twenty inches, but seen only dimly. The atropine was continued and the patient seen twice a week for five months, when the vision and refraction were found to be still unchanged. At the end of another month, altogether making six month's use of the atropine, patient had normal sight with a convex twenty-inch glass.

CASE XII.—A boy aged ten year applied for treatment.

July 12, 1888.—Until two years ago vision all right. He attends school in the winter months. Does not study at home. Under atropine two days, with the general symptoms of atropine poisoning, fever, dry throat, etc., vision in both eyes $^{20}/_{CC} +$; with minus sixteen-inch glass, vision normal. He was kept under atropine ten weeks, with the result that the vision in both eyes became slowly normal without glasses. Atropine stopped. One month later vision still normal without glasses. Patient went back to school and resumed his studies. After a time the spasm returned; the use of atropine was followed by relief, only to have another relapse soon after returning to school. Patient was lost sight of for several years.

March 19, 1891.—Under atropine has a myopia of 3.5 D. S. Accommodation paralyzed completely by atropine. The atro-

pine was stopped and a mild trachoma treated. The vision improved to 20_{LXX} without glasses after a month's treatment of the lids, when the patient again disappeared.

It seems reasonable to infer that this patient might have been permanently benefited after receiving temporary relief if he could have been kept under observation and received proper care.

Conclusions.—1. Spasm of the accommodation can not always be relieved by atropine.

2. The vision of symptomatic myopia can often be improved so that glasses are unnecessary.—*N. Y. Med. Jour.*

OBITUARY.

THE LATE DR. C. J. LUNDY.

The profession will learn with sorrow, of the death of Dr. C. J. Lundy, which occurred at his residence in Detroit, Tuesday, May 24. The deceased had been suffering for some time, and only recently had returned from the South, where he had been sojourning for his health. The cause of death was appendicitis. An operation was undertaken for the relief of the trouble, but the patient's strength, already broken by his long sickness, failed him. Dr. Lundy saw many of his friends for the last time, when at a recent meeting of the State Medical Society, he was proudly and unanimously elected its President. The profession, in his death, loses an able and accomplished member. Charles J. Lundy was, at the time of his death, forty-six years of age. He received his degree from the University of Michigan in 1872. He went to Bellevue Medical College in 1873 and graduated from that institution in 1875. He then devoted special study to ophthalmology and returned to Detroit in 1878, where he has since enjoyed a large and lucrative practice. He was Professor of Ophthalmology in the Detroit College of Medicine. He has filled many important medical positions, having been President of the Detroit Medical and Library Association, and, at the same time of his death, President of the State Medical Societies, and one of the collaborators of this journal.

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

SEPTEMBER, 1892.

No. 9.

ORIGINAL ARTICLES.

REMOVAL OF A FRAGMENT OF STEEL FROM THE VITREOUS CHAMBER BY MEANS OF THE ELECTRO-MAGNET, WITH PRE- SERVATION OF NEARLY NOR- MAL VISION.¹

BY SAMUEL THEOBALD, M.D.,

Ophthalmic and Aural Surgeon to the John Hopkins Hospital and to the Baltimore
Eye, Ear and Throat Charity Hospital.

The successful employment of the electro-magnet for the removal of fragments of iron and steel from the vitreous of the eyeball has become of such frequent occurrence that one hesitates to report such cases unless they present features of especial interest. The fact that in the present instance the foreign body was not removed until the eleventh day after its entrance into the vitreous chamber, and the further fact that in an eye otherwise doomed to destruction nearly normal vision

¹A paper read before the American Ophthalmological Society, July, 1892.

was restored through the magnet's efficient action, seemed features of sufficient interest to justify my presenting a brief report of the case to the Society.

C. H., æt. 12, was first seen April 1, 1892, in the out-patient department of the Baltimore Eye, Ear and Throat Charity Hospital. Six days before, while striking a hatchet with a hammer, a small fragment of steel has been broken from one of them and had struck his left eye with such force as to cause severe pain and much impairment of vision. The eye exhibited marked conjunctival injection, and upon closer inspection a small scar was discovered at the upper and outer corneal margin and just in line with this a hole in the iris, close to the periphery, of corresponding size. At the anterior pole of the lens, apparently just under the capsule, there was a slight opacity, and with the ophthalmoscope, besides numerous floating opacities in the vitreous, so much diffuse clouding was discovered that the details of the fundus could not be distinguished. Vision was found to be $\frac{16}{\text{CXXV}}$. There was little room to doubt that the piece of steel was in the eye, although owing to the clouding of the vitreous humor its location could not be determined with the ophthalmoscope, and its removal with the electro-magnet was proposed. The instrument not being at hand, the operation was postponed until the next day. On the following day the chloride of silver ("dry cell") battery with which I had provided myself failed to produce in the magnet (Hirshberg's) any but the most feeble action, and a further postponement was unavoidable. An interval of four days occurred after this before an opportunity to operate upon the eye presented itself. In the meantime the inflammation had not lessened and iritis had set in. I had decided misgivings as to the likelihood of my efforts to remove the foreign body being successful, after so long an interval from the date of the accident, but it was evident that enucleation at no distant day was the other alternative and, influenced by this consideration, I did not hesitate to undertake the operation. Chloroform was administered and antiseptic precautions, consisting in the sterilization of the magnet point and other instruments with

boiling water, and the flushing of the conjunctival sac with sublimate solution (1 to 8000), were exercised. A free longitudinal incision was made through the conjunctiva, between the external and inferior recti muscles, behind the ciliary body, and the tissues dissected back so as to expose the sclerotic at this point. A Beer's knife was then passed through the sclerotic and inner tunics of the eye, making a longitudinal incision about 4 mm. in length. There was considerable hemorrhage, but the vitreous showed no tendency to escape. Although it had not been possible to locate the foreign body, the greater amount of opacity in the outer and lower quadrant of the vitreous humor and the accessibility of this part of the sclerotic determined the site of the incision.

The magnet point, freshly sterilized, was now introduced a short distance into the wound and withdrawn. Examination of the tip showed that the fragment of steel had not been attracted to it. A second, third, and possibly a fourth introduction of the point, which was pushed farther into the vitreous chamber and turned in various directions failed as completely to accomplish the desired result, and I almost concluded that it would be useless to make further attempts. I determined, however, to try once more, and this time probably carried the magnet point nearer to the ciliary body than I had done before, and upon withdrawing it I was rejoiced to find the bit of steel adhering to it. It was irregular in shape, having one edge especially sharp, measured about $1\frac{1}{2}$ mm. in length, 1 mm. in width and $\frac{1}{2}$ mm. in thickness and weighed but a fraction of a grain.

The magnet, which was operated by a single, small Grenet cell (zinc and carbon), was tested before the operation and found to be capable of lifting a pocket key-ring with four or five keys attached to it.

The after-treatment of the eye consisted in the constant application of a lotion of opium and boracic acid and the instillation of atropia. The improvement in its condition was rapid and uninterrupted, and when the patient left the hospital April 23 (seventeen days after the removal of the foreign body) the

subconjunctival injection had greatly diminished and the vitreous humor was clearing rapidly; the opacity at the anterior pole of the lens was also less marked. Vision at the time was ¹⁶/_{XLV.} The pupillary margin of the iris, at a point corresponding with the wound made in the cornea and iris by the entrance of the foreign body, had formed an adhesion to the lens capsule before the removal of the steel, and this persisted despite the liberal use of atropia.

The case was kept under observation in the out-patient department, atropia only being used, and continued to progress favorable. May 2, Vision had improved to ¹⁶/_{XXX.}

At my request the patient called at my office a few days since (July 6). No treatment had been practiced for some weeks. The difference in the appearance of the two eyes was scarcely perceptible. The pupil of the injured one was not quite circular, and there was just a trace of hyperemia in the finer conjunctival vessels. In the neighborhood of the wound made through the sclerotic at the time of the operation the hyperemia was, of course, more marked, and there was still considerable thickening of the episcleral tissue at the point; but, this could be seen only when the eye was directed upward and the lower lid somewhat everted. The lad assured me that the injured eye gave him no annoyance whatever, and that he felt no dread of light. Upon examining the lens a very small, well-defined circular spot of opacity was found just under the capsule at the anterior pole—the only remains of the more diffuse opacity observed in this part of the lens when the case first came under observation. The peripheral wound through the iris was easily found, but was less conspicuous than when first discovered. The ophthalmoscope revealed no opacities in the vitreous humor and showed a normal fundus except in the region of the sclerotic incision. The site of the latter was indicated by a linear white patch, and just in front of this, and separated from it by an isthmus of normal choroid and retina, there was another spot of atrophy, much smaller and circular in shape, through which the sclerotic could also be distinctly seen. I could make out no evidences of retinal detachment.

The small, circular area of atrophy which was situated between the sclerotic wound and the ciliary body, marked, in all probability, the point where the fragment of steel impinged, and to which it remained attached. If such was the case, the point of the magnet must have been in close proximity to the foreign body each time that it was introduced and only failed to extract it at first because, as might have been expected after the lapse of so considerable a time from the receipt of the injury, it had become more or less perfectly encapsuled.

A test of the vision of the two eyes, both of which were decidedly hypermetropic, showed but a slight difference between them. With $+.75$ s. the left (injured) eye had $V=^{20}_{xxv}+$, and the right eye with $+.87$ s. $V=^{20}_{xx}-$. The possibility of making a further improvement in the vision of each by means of cylinders was not gone into.

It is too soon yet, and probably always will be too soon, to say that an eye which has been through the experience this one has, will never give trouble, but in this present instance I have little fear as to the future.

CONSIDERATIONS ON SOME OF THE CHRONIC AND SEVERER FORMS OF DACRO CYSTITIS.

BY G. STERLINE RYERSON, M.D., C.M., L.R.C.S., EDIN.,

Professor of Ophthalmology in Trinity Medical College, Toronto.

There are two forms of dacro-cystitis which are sources of especial trouble not only to the patient but to the ophthalmologist.

The first is recognized by a very considerable distension of the lachrymal sac, the walls of which are *thinned*, and distended by thin, or less often thick, muco-purulent matter. It often happens that for a day or two together the patient is unable to empty the sac. When empty the walls are in apposition.

The second form presents an enlarged sac which cannot be emptied entirely by pressure because the walls are *thickened*. The discharge in this form is usually muco-purulent, glairy and thick. It is important practically to recognize these two forms as the successful treatment in either case is very different.

In the *thinned* form the duct should be slit up from the puncture, any stricture of the nasal duct freely divided and a No. 6 probe passed daily. Or in case the patient can be persuaded to wear it a silver or celluloid style should be introduced and allowed to remain. The style has many advantages over the probe; it is painless after the first introduction; the patient can go away from the oculist for weeks together without suffering for it; the constant pressure causes the stricture to absorb, and it can easily be kept clean by lifting it daily. Three months constant wearing of a style will cure almost any case of lachrymal stricture. I prefer a piece of pure silver

wire the size of a No. 5 probe, which I cut to the required length, and after filing the sharp edges off, bend so as to suit the curve of the duct which varies a good deal, and form a crook on the upper end so that it shall not slip into the duct. Having made sure that the duct shall remain patent, attention should then be directed to the sac itself. By this injection with Anel's or Panas' syringe and hollow probe of various antiseptic and astringent solutions. The best of these are peroxide of hydrogen, boric acid, methyl violet, but especially Harvey's acrolozone¹. The cure will be hastened by the occasional use of a solution of nitrate of silver, 20 grains to the ℥j, injecting a few drops only. The prognosis in the *thin* form treated in this way is good. From one to three months will suffice to effect a cure.

The treatment of the *thick* forms consists in the ablation of the hypertrophied mucous membrane. It is recommended in most of the works to use various caustics but I have found that laying the sac open freely and scraping the membrane away with a sharp spoon or curette accomplishes the desired end and still leaves a pervious canal. It is generally necessary to insert a style to keep the passage open during healing.

¹"Harvey's Acrolozone. $C_3H_5O_3 + O_3$.—Acrolozone is a new chemical and the most powerful antiseptic, organic disinfectant and bactericide at present known. Acrolozone is prepared in a liquid form, is clear and without smell, the taste is slightly sweetish and not at all unpleasant. Any physician who gives this agent one trial will, I am convinced, in the future reject carbolic acid, iodoform, iodol, boracic acid, etc.

The absolute purity and mode of preparation of "Harvey's" Acrolozone renders this most powerful antiseptic both safe and quick in its action and non-irritating, and at the same time much more staple than hydrogen peroxide. When Acrolozone is brought in contact with a suppurating surface or cavity its action is much more regular and moderate than hydrogen peroxide, and owing to its strength and the vast quantity of ozone it contains, and the method of manufacture, the ozone is not so rapidly decomposed into oxygen and spent. On account of the slower and more even action of Acrolozone the ozone is a very much longer time in contact with the unhealthy surface.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, JUNE, 9, 1892.

HENRY POWERS, F.R.C.S., President in the Chair.

DETACHMENT OF THE CHOROIDEA.

Dr. Story (Dublin) reported this case, the notes of which were read by the Secretary. The patient, a female, aged 24, gave a history of failure of sight in the right eye twelve months previously; the eye subsequently became, according to her account, so painful that she wished to have it removed. On admission to the hospital the vision of the right eye was reduced to counting fingers at 1 metre. Soon after admission the pain, of which her account was evidently exaggerated, disappeared. On ophthalmoscopic examination there was found to be a large detachment of the retina extending from the margin of the optic disk downward. No rent was visible in the retina; all over the detached portions were small, brilliant, white spots, and also larger circular and linear white patches of degeneration. The choroid coat was also detached over a corresponding area; its structure could be easily made out through the overlying retina, except where the above-mentioned patches obstructed the view. The tension of the eye was normal and there was no external signs of disease. Reference was made to a case published by the author in the Society's *Transactions* last year.

CHANGES IN THE RETINA, DUE 'TO LONG-CONTINUED LODG-
MENT OF A METALLIC CHIP ON THE SURFACE.

Mr. Priestley Smith read notes of the case of a lad, æt. 17, who was struck in the left eye by a fragment of bell metal. When first seen (four weeks after the injury) a small linear cicatrix was visible in the cornea close to its inner margin, behind this a black point in the iris probably indicated an aperture made by the chip. The lens was clear; the chip of metal, triangular in shape, could be seen lying on the retina some distance from the nasal side of the disc, and on rather higher level. Its position was shown by a scotoma in the perimeter chart. The eye was free from pain or other symptoms, and vision was $\frac{6}{18}$. About four months later the foreign body shifted its position to a slight extent, its heavier end moving slightly downward; one month later, the whole chip dropped directly downward through an angle of about 45 degrees, according to the chart. Its former position was marked by a grey opaque patch on the retina, around which was a cloudy zone bordered by a faint pigmentary discoloration. Two scotomata were now shown in the chart, the second one indicating the new position of the chip. Thirteen months after the accident the position of the foreign body remained unchanged; its surface was less lustrous than at first. On the chief arteries and veins of the retina were numerous minute shining points, looking like specks of gold-leaf. The eye remained free from pain or injection, and the lad was regularly at work. Mr. Priestley Smith thought it unlikely that the eye would remain permanently in its present quiet and useful condition. The foreign body, though aseptic in the ordinary sense, was acting surely though slowly as a chemical irritant. The question as to the possible danger of this chemical action to the fellow eye is one concerning which further information is desirable.

The President referred to the case of a man who was struck in the eye by a chip from a hammer, which remained imbedded in the optic nerve for twelve years; the eye had retained

perception of light, and, though liable to slight recurrent attacks of pain, has not caused sympathetic disease in the fellow eye.

Mr. Snell mentioned the case of a boy with a fragment of metal in one eye, but with retention of vision in that eye. He thought it important in these cases to keep the patient at rest for some time after the accident, so that the chip might become firmly attached to the retina or other tissues by the lymph which is thrown out around it.

Mr. Tweedy spoke of a man who had been under his care about ten years ago, in whom a small chip of steel had passed through the cornea and lens and become embedded in the retina. The chip became covered over by grey lymph, and the eye remained perfectly free from pain or irritation. The lens did not become opaque, although a small linear scar was visible in it. The patient was seen at intervals for twelve months after the accident.

Mr. Critchett mentioned a somewhat similar case, which he had watched for three years. During that time the eye remained quiet, and vision was but slightly impaired.

Mr. Lang referred to a case published by the late Mr. James Adams in vol. 1 of the Society's *Transactions*. This patient had a fragment of steel embedded in the retina, and covered by lymph. At the end of five years the eye was still free from irritation and vision = $\frac{6}{vi}$.

RECURRENT KERATITIS SUPERFICIALIS PUNCTATA, IN WHICH THE USE OF COCAINE AGGRAVATED THE SYMPTOMS.

This case was reported by Dr. Adolf Bronner (Bradford). The patient, a male, aged 48, first suffered from an attack in the right eye in March, 1867, and the disorder recurred every year, usually in March or April, and nearly always in the same eye. During an attack which occurred in 1885, cocaine drops were used, and the consequence was an increase in the severity and duration of the attack. In March, 1892, when the case first came under Dr. Bronner's care, the right eye was again

affected, and the symptoms which had existed for a week, subsided in five days under treatment by atropine. As a result, however, of exposure to a strong wind the left eye became affected. There was severe pain in the eye and forehead, and intense photophobia; the lids were red and swollen, and there was much chemosis. The pupil was dilated, and over the lower half of the cornea there were 15 to 16 small white elevated spots. The application of cocaine produced two or three minute's ease, and then the old pain returned with increased severity, all the symptoms and appearances becoming exaggerated. After the subsidence of the attack the cornea was perfectly clear and free from nebulæ. Somewhat similar cases have been recorded by several German authors, and one also by Mr. Marcus Gunn in the Society's *Transactions* for 1890.

Mr. Holmes Spicer mentioned the case of a little girl, æt. 7, who had been under his care. The symptoms and appearances closely resembled those described by Dr. Bronner; except that the recurrences were less regular.

Mr. Gunn referred to cases he had brought before the Society two years ago, soon after Fuchs had published his description of this form of keratitis.

DOUBLE OPTIC NEURITIS AFTER INFLUENZA.

Mr. Simeon Snell (Sheffield) read notes of two cases, both occurring in females, one aged 19, the other 13½. In each case failure of sight came on a few weeks after recovery from an attack of influenza. When the elder girl came under observation the neuritis had nearly passed off; the optic discs were atrophied, and all perception of light abolished. The younger patient was seen three weeks after the sight began to fail; the neuritis was then well marked. The right saw $\frac{3}{4}$ cc, the left eye $\frac{4}{5}$ cc. The neuritis had, to a great extent; cleared up, but the discs were atrophic-looking, and there had been very little improvement in sight. Mr. Snell referred to the cases published by Macnamara and Lee.

Mr. Marcus Gunn mentioned a case under his care at Moor-

fields, in a man, æt. 45. There were very slight visible changes in the discs, but sight in one eye was abolished, and in the other was defective. He thought the case was one of retro-ocular neuritis, and an attack of influenza a short time previously, was the only cause to which the condition could be ascribed. Recovery began in a couple of weeks, and the blind eye regained useful vision.

Mr. Cross (Clifton) referred to two cases he had seen, both in young women, in whom there was no evidence of intracranial disease, and nothing which seemed to bear a casual relation to the neuritis except influenza. In these cases vision failed rapidly within a few days of the attack.

Mr. McHardy spoke of two cases he had seen, and which he had considered as most probably due to influenza, no other cause being ascertainable. Both his patients were females, and in both was temporary albuminuria. He had treated them by absolute rest in bed, and the administration of iron; recovery ensued.

CORRESPONDENCE.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY.—I wish to correct a statement made by me in your January number of this year. One of the operations for entropium there was described consists essentially in making the von Burow cut through the tarsus from the under side turning back the edge of the lid with sutures to make the wound gape, and filling the wound with a piece of lip membrane, or a Thiersch skin-flap. After the description, I added, that while lip might, *a priori*, be considered preferable, on account of the contact of the flap with the cornea, in reality, skin answered just as well; the cornea bearing friction with it perfectly after the first week or so. The seven operations of the kind which I had then performed led me to make this statement unqualifiedly. Further experience, however, has given me the impression that if the operated lid still contains any trachomatous tissue irritation of the cornea is more likely to recur where skin is used than when the flap is from the lip. As long as copper sulphate is applied regularly the skin flap rubbing on the cornea causes no more sensation than normal conjunctiva, but when this is discontinued for a time, it has seemed to me that corneal irritation occurred oftener than the slight remnants of trachoma would account for. I have consequently used lip almost exclusively in my later operations of this kind.

Sincerely yours, H. GIFFORD.

REVIEW.

MINERS' NYSTAGMUS AND ITS RELASION TO POSITION AT WORK
AND THE MANNER OF ILLUMINATION. By SIMEON SNELL, of
Sheffield-Bristol. 1892.

For several years Mr. Snell has interested himself in the subject of "Miners' Nystagmus," his first paper having been published ia 1875. Since that time he has been unwearied in his investigation to arrive at the true cause of the affection and to determine whether this was due to the position of the miner while at work, or to the character and quantity of the illumination; this latter having been contended for as the cause by some.

This work of 143 pages is the summing up of his own experience and experiments as well as that of others, including some on the continent and they prove beyond question that the prime cause is the peculiar position of the laborer when at work. The treatise has a large number of illustrations many of which are reproductions of photographs showing the various positions assumed by the operators while at work.

BURNETT.

SELECTIONS.

AN OVERLOOKED FACTOR IN THE PRODUCTION OF CONJUNCTIVITIS.¹

BY JULIUS POHLMAN, M.D., BUFFALO, N. Y.

We are told by ophthalmologists that the eye when exposed to artificial illumination depends upon three distinct qualities of the light for its well-being, namely, (1) its whiteness, (2) its steadiness, and (3) the amount of heat which it radiates.

Hardly anybody will dare to underestimate the importance of the whiteness and the steadiness of a light. Optic nerves are organs specialized to receive sunlight, and hence the nearer the artificial illumination resembles it, *i. e.*, the whiter it is, the more the eyes remain in their natural condition; and the labor of the optic nerve, to adapt itself to the artificial surroundings, by means of muscular exertions, is reduced to a minimum to the advantage of the eye as a whole,

When we consider the function of the iris, to regulate the quantity of light which is to strike the retina and to reduce the variations of that quantity to the minimum, we can understand how a flickering flame, no matter how white, necessitates an immense strain upon this delicate muscular apparatus, a strain which increases with the unsteadiness of the light.

The third factor, however, the heat which the light radiates, in its influence upon the eye, does not seem so plain. We are taught that heat affects the conjunctiva, and that conjunctivitis

¹Read at the meeting of the Alumni Association, Buffalo University Medical College, May 3, 1892.

are often found in occupants of poorly ventilated rooms where hot lights are burning more or less all day; and that certainly seems to demonstrate the correctness of the theory. Nevertheless, how heat, *i. e.*, a simple difference in temperature, should injure the conjunctiva enough to produce pathological conditions, has never seemed quite clear to the writer, because, if this depended merely upon a quantity of heat, then why should a temperature of 75° or 80° , produced by gas flames injure the conjunctiva, when a summer heat of 95° or 100° , or even more, does not? If simply a question of temperature only, then the effects ought to be the same, no matter what the source of the heat, because the whole eye is subjected equally to its influence and not a small part of it alone; were it otherwise, we might defend the apparent difference in the effects of natural and artificial heat on the same lines as we differentiate between wind and draught: one striking the whole body, the other only a circumscribed portion of it, thus having differing conditions with differing results. But this line of reasoning cannot be applied to the eye. As, however, the effect produced on the eye by the heat of artificial light does differ from that produced by natural heat, we must look for other or additional causes which injure the conjunctiva.

Dr. Frank P. Vandenberg, for many years City Chemist of Buffalo, informs me that the manufacture of light gas in this city is rather behind the times; made from bituminous coal by the old-fashioned process of dry distillation, it always contains a considerable quantity of sulphur; for instance, the average of numerous analyses shows that the product of the Buffalo Gas Light Company has 12.08 grains of sulphur in every 100 cubic feet of gas; the Mutual Company, 12.93 grains, and the Citizens' Company, 9.68 grains. That means that for every 100 cubic feet of gas burned, ten to twelve grains of sulphur are given to the air in the form of fumes, which, as we all know, have a special affinity for moist surfaces forming there sulphurous acid.

Several years ago the leading librarians of the country made quite extensive reports upon the corroding influence of gas

light upon the leather bindings of books. If the sulphur compounds can corrode leather in the course of time in large well-ventilated libraries, are we not justified in assigning some influence to them when acting on the moist conjunctiva in a poorly-ventilated room with gas burning, perhaps, all day, or throughout the time when the eyes are exposed to the heat of the flame?

It may be quite appropriate here to mention that the natural gas used in Buffalo contains no sulphur, and will, therefore, with the right kind of burner, produce a light superior to that of artificial gas as far as any injurious effect upon the conjunctiva is concerned.

More important, however, to the eye than this small amount of sulphur is the quantity of moisture which air holds under varying temperatures. It is an old and well-known fact that the hotter the air, the larger the amount of water which it contains, and the lower the temperature the smaller the amount, all other things being equal. Supposing a room contains a certain amount of moisture at 50° when the outside air is 40° , then, if we raise the temperature of the room to 70° , we must apply a certain amount of water for evaporation in order to have the air and warmth feel agreeable, *i. e.*, not too dry; for the outside air coming in at a much lower temperature is still drier than that contained in the room originally, and we must resort to artificial means in order to supply the demand.

Artificial heat in its drying effect upon furniture, doors, etc., has often been discussed, but it seems that such discussions have always stopped at dead matter and have never been applied to living bodies.

To investigate the effects of the dryness of the air on the conjunctiva, the following experiments were made:

The room used was 12 x 13 feet, 9 feet 6 inches high, and heated by natural gas burned in an open front Jewett gas burning stove; this particular kind of stove has a water-tank at its back which holds two quarts of water, and forms part of the structure, so that the flames play directly against one side of it. When running at full blast, to keep the room at 65° to 70° ,

the contents of the tank evaporated in about six hours; in other words, it took about two gallons of water in twenty-four hours to keep the air of the room supplied with the moisture necessary for its temperature when it was freezing outside.

The ventilation of the room and the draught of the stove were perfect, and no product of combustion, complete or incomplete, or other gases of any kind from leaks in pipes or otherwise, could enter the room and mix with the air; all sources of error in this direction were avoided as carefully as possible, so that the effects produced upon the eyes of the occupants of the room were due solely to the peculiar condition of its atmosphere and to nothing else.

The experiments were made at thirty different times, lasting from thirty minutes to two hours each, upon the writer's own person. The effects produced were repeatedly corroborated by visitors who happened to call at such times, and who knew nothing about the experiments to which they were unconsciously subjected during their visits; hence, their complaints would have to be called entirely unbiased and unprejudiced, but their symptoms were always identical with those experienced by the writer.

With a temperature of 65° or 70° when the water-tank on the stove was empty and the air of the room relatively dry, an exposure of fifteen minutes made the eyes feel dry and sticky; if prolonged for another fifteen minutes, or if the temperature was raised to 80° or 85° , the symptoms became more decided, —the peculiar sensation of a foreign body in the eye, like a particle of sand or some stringy substance, became very strong. The conjunctival vessels of the lids looked engorged, the more the longer the exposure, and after a stay in a dry atmosphere of 80° for about two hours, the conjunctival vessels of the bulb were equally well marked, and the eye presented in every symptom a well-developed case of acute conjunctivitis.

While cold has a stimulating effect upon the lachrymal gland, heat apparently does not act in that way; whether it has an inhibitory function, is not yet decided, but it certainly

does not increase the secretion, and though the ordinary amount of lachrymal fluid is sufficient to keep the eye moist and clean under ordinary conditions, the gland does not secrete fluid enough when the air is too dry for its temperature, and hence calls for a more rapid evaporation from all moist surfaces. The eye tries hard to overcome this deficiency by increased winking, but to no avail; evaporation from the conjunctiva proceeds quicker than the moisture is supplied by the lachrymal gland, and its surface becomes proportionally dry, producing after awhile the disagreeable sensations of conjunctival troubles.

Whether the mechanical irritation produced by the friction of the dry conjunctival surfaces has the effect of dilating the capillaries and producing in this wise a slowing of the blood stream with the attending phenomenon of engorgement, or whether the heat has such an effect upon the partially dry eye which it would not have upon the normally moist organ, or whether there are other causes which, by themselves or in addition to those mentioned, produce the engorgement, must be left for additional investigations to decide, but that the acute conjunctivitis, mild or severe, was caused by the dryness of the air and not by the heat, was demonstrated during every experiment as follows:

Whenever, during the course of an experiment, the water-tank on the stove was filled, and free and rapid evaporation restored the equilibrium between heat and moisture, then, no matter whether the temperature of the room was 65° or 85° , the annoying symptoms disappeared in a few minutes if the exposure had not been too prolonged. In the early stages of the experiments, just when the eye commenced to feel sticky, a simple dropping of a few drops of water between the lids caused an almost instantaneous disappearance of the distressing sensations, but they returned equally promptly, and with unvarying certainty, if the eye was again exposed to the dry air. If bathed continually, no matter how hot or how dry the eye, the eye felt as comfortable as under normal conditions,

and none of the symptoms appeared as long as the conjunctiva was supplied with the required moisture.

What happens in the room as a whole, will take place on a smaller scale in the vicinity of a lamp,—the temperature is raised and the air is dried correspondingly, and whenever the eyes are near enough to the flame to feel its heat, they will be affected by the dryness of the air, and the hotter the light the dryer will be the air that surrounds it.

If additional observations prove this theory to be correct, then we can understand why a summer temperature of 95° or 100° , holding its normal quantity of moisture, has no effect on the eye, while artificial heat of 70° , with its usual corresponding dryness, can produce very decided forms of conjunctival troubles, and we learn that a little closer attention to the water-pan on the furnace or on the stove, is as necessary to the well-being of our eyes as the efficient lighting of the room. And if repeated experiments finally develop the fact that heat has no effect upon the conjunctiva, then we have to modify our teaching regarding the well-being of our eyes under artificial illumination, and name as the three factors necessary, whiteness and steadiness of the light, and moisture in the air surrounding the flame proportionate to its temperature.—*Buffalo Medical and Surgical Journal*.

ANTISEPSIS IN OPHTHALMOLOGY.¹

BY S. G. DABNEY, M.D.

Clinical Lecturer on Diseases of the Eye, Ear and Throat in Hospital Medical College, Consulting Surgeon to the Eye and Ear Department of Louisville City Hospital.

We are told by Dr. Knapp that in 1871 he made a visit to Edinburgh with the special purpose of acquainting himself with Lister's method, and when he asked Lister whether this method would be productive of much benefit in ophthalmic practice, he replied in the negative. The small field of operation, the protection afforded by the lids, the antiseptic lachrymal secretion, and the usually simple instruments employed, all combined to render the duty of infection less in operations upon the eye than in most other parts of the body. Nevertheless, almost every ophthalmic surgeon would now feel that he was subjecting his patients to an additional element of danger by neglecting antiseptics, or at least careful asepsis, in every surgical procedure; moreover, the successful treatment of many diseases of the eye rests on a knowledge of their infectious character and the proper application of antiseptic agents. I wish, therefore, to briefly call attention to antiseptics in ophthalmology, first, its application to operations on the eye and its appendages, and secondly, in the treatment of ocular disease.

Strictly speaking, we aim rather at asepsis than antiseptics in ophthalmic surgery. Before any operation on the eye or the

¹Read before the Thirty-seventh Annual Meeting of the Kentucky State Medical Association.

lids, the parts should be very carefully cleansed with hot water and with a 1-4,000 solution of bichloride of mercury. Especial attention should be given to cleansing the lids near the margin, as Weeks has shown that this locality is a favorite lurking-place for pathogenic germs. A solution of the bichloride of the strength indicated will not usually be found irritating, but in case of extraction of cataract this drug has caused opacity of the cornea, and by many a four-per cent solution of boracic acid is preferred. The investigations of Weeks show this drug to be almost without effect on the staphylococcus pyogenes aureus, but it is still largely used in ophthalmic practice.

To cleanse instruments boiling water is the very best agent. According to Gerster the liability to rust may be removed by adding common soda, a tablespoonful to the quart. A solution of carbolic acid strong enough to be a speedy and certain antiseptic is disagreeable to the surgeon's hand, and bichloride of mercury to be efficient would be likely to injure the instruments, hence the superiority of hot water.

During the progress of an operation where considerable dissection of the tissues is required, as occasionally in muscular advancement and plastic operations, the parts should be frequently irrigated with a solution of bichloride of about 1 to 4,000.

As regards the surgeon's hands, thorough cleansing with hot water, soap, and nail-brush is alone sufficient, but additional precaution may be obtained by immersion in a solution of the bichloride of mercury, 1-1000. In cataract operations it is the custom of some operators to wash out the anterior chamber, thus removing any remaining cortical fragments with a boracic-acid solution, but in general it is safer to accomplish this end by gentle pressure, milking out with an instrument applied to the lower part of the cornea. Knapp warns against using the edge of the upper lid to make counter-pressure on the wound, as he considers this a dangerous source of infection. After operating for stricture of the lachrymal duct, it is

well to inject through it a solution of bichloride of the strength above indicated.

As regards the dressing after operation, it may be very simple. A little lint smeared with vaseline is laid over the closed lids, and upon this a layer of absorbent cotton soaked in a solution of the bichloride, and finally, a little dry absorbent cotton to fill out the orbit, the whole held in place either by strips of adhesive plaster or a roller bandage. For my own part, after using the adhesive plaster dressing for several years, I have returned to the roller bandage, as I find this more comfortable to the patient and to more thoroughly steady the eye.

It is not wise to put the bichloride dressing immediately next to the skin, as a very disagreeable erythema is often so produced. The presence of diabetes mellitus probably increases the dangers of suppuration after an operation in the eye as elsewhere, and yet the statistics of removal of diabetic cataract do not show any greatly excessive number of suppurative cases. Of course, the diabetes should be reduced as much as possible before the operation. Careful examination of the tear-sac should be made before any operation on the eye-ball. A chronic dacryo-cystitis is a most dangerous source of infection in such cases.

It is a remarkable fact that the apparently simple operation of needling for capsular cataract, even when performed with every antiseptic precaution, is sometimes followed by suppuration. Knapp accounts for this on the theory of latent pyogenic germs in the eye being excited to activity by this second operation. I have seen no cases in my own practice as yet.

The prophylactic treatment of sympathetic ophthalmia by injection of a solution of bichloride of mercury into the eye as suggested by Abadie, has not, so far as I know, found any advocates in this country.

It is, however, in the treatment of corneal and conjunctival disease that antiseptic remedies are of the greatest value in ophthalmology.

First, in importance here, because in my experience first in its efficacy, I would place the actual cautery in the treatment

of suppurating ulcers of cornea, especially that form known as *ulcus serpens*. I have found this treatment infinitely superior to any other in this disease. At my clinic at the Hospital College I have on several occasions simply cauterized the ulcer once with the red hot probe, prescribed the application of a hot solution of the bichloride at home, and been rewarded a few days later by seeing the eye far on the road to recovery. The application of 4% solution of cocaine renders the burning painless.

Next in its value and of wider application is nitrate of silver, a remedy long used with great success in diseases of the eye, and also, like every other powerful agent, liable to most dangerous and disastrous misapplication. According to the bacteriological experiments of Weeks, 1% solution of nitrate of silver is a most speedy and certain destroyer of the *staphylococcus pyogenes aureus*, and presumably of the *gonococcus* of Neisser also; hence arises the great value of this drug in suppurative conjunctivitis.

The bichloride of mercury solution, from 1-5,000 to 1-10,000, is also of frequent advantage in suppurative ophthalmias and in ulcers of the cornea. I prefer it in cases of inflammation the tear-sac. The solution should be passed into and if possible, through the sac into the nose with the lachrymal syringe after slitting the canaliculis. It is in diseases of the tear-sac, and scarcely anywhere else, that pyoktanin still finds some use in ophthalmology. A solution of 1-1,000 is a safe antiseptic, but after a trial of it in several cases I do not believe it to be at all superior to the bichloride. This aniline dye, for which such extravagant claims were advanced a few years ago by Stilling, of Strassburg, and which for a time found a wide application both in solution and in solid stick, and even as intra-ocular injection, has almost lost its place in ophthalmology, and except in tear-sac disease, and by some in ulcers of the cornea, is rarely used.

The peroxide of hydrogen, too, has but a limited field of usefulness in ocular disease. It may be used to advantage in purulent dacryo-cystitis, but if strong enough to be efficient, it

will be painful to the eye, and hence should be preceded by an application of cocaine. Where there is an ulcer of the cornea with purulent base and edges, the bubbling peroxide beautifully outlines the ulceration; but in my experience it is not nearly so valuable an application here as the actual cautery.

In certain forms of phlyctenular ophthalmia the dusting of the phlyctenulæ is a most valuable local treatment. Since Weeks has shown that calomel has a high rank as an antiseptic, we may probably account for its action in such cases on this ground. The yellow oxide of mercury salve is valuable in the same way. The oil of cade is a useful application in many cases of marginal blepharitis, and it too is an antiseptic of decided strength.—*Am. Prac. and News.*

STEEL IN THE IRIS FOR TWENTY-SEVEN YEARS —SYMPATHETIC INFLAMMATION—OPERA- TION—RECOVERY.¹

BY GEORGE F. KEIPER, M.D., LAFAYETTE, IND.,

Oculist and Aurist to St. Elizabeth Hospital.

In the *Medical News* of October 10, 1891, was published the following article by Dr. F. C. Heath, then of Lafayette: "Sometime in 1864, Mr. P. E. H. was engaged in reaming a tire on a locomotive engine, when a small piece of steel, about two mm. long, from the reamer, penetrated the corner of his right eye, lodging in the iris about midway between the pupil and the outer margin. In about four weeks the "irritation" fully subsided. It gave no further trouble until five years ago, when inflammation arose, as he thought, from irritation of the eye by gravel. This quieted down after a week's treatment by Dr. J. L. Thompson, of Indianapolis. The patient came to me in June last, with a well-marked iritis that had started five days before. He again made a good recovery under two weeks' treatment with atropine, leeches, etc., and the eye has been free from pain, ciliary injection, and other symptoms of iritis, ever since. The vision is unaffected. It is exceptional for a foreign body to remain so long in the iris, and produce so little trouble. Noyes mentions a similar case of nineteen years' duration, but this is twenty-seven."

In the *New York Medical Journal*, November 28, 1891, in "Reports on the Progress of Medicine," under the title of General Surgery, by Matthias L. Foster, the report ends thus: "Heath reports (*Medical News*, October 10, 1891), a remarka-

¹Read before the Indiana State Medical Society, May 13, 1892.

ble case in which a piece of steel penetrated the cornea of the eye of a man in 1864, lodged in the iris and way between the pupil and the outer margin, and did not cause material injury to the eye. Two subsequent attacks of inflammation may have originated from the presence of the foreign body. But he made a good recovery each time, and the vision is unaffected. It is exceptional for a foreign body to remain so long in the iris and produce so little trouble."

Thus ends the first chapter of the experiences through which this unique case passed. But this is not all. December 10, 1891, he presented himself in my office with an intense inflammation, which he said had been in existence for ten days past. He thought it would subside by using Dr. Heath's prescription. He was immediately warned of the dangers of sympathetic inflammation. The media of both eyes were clear. Treatment consisted of leeches, atropia and hot fomentations, persistently applied. Gradually the eye became worse. On the morning of December 15, when he presented himself for examination, pain was more intense than ever, photophobia marked, lachrymation profuse, and the vitreous of the inflamed eye was clouded. The left eye showed photophobia and lachrymation with slight cloudiness. When told of the condition and the danger of further delay, and the probability of cure, he consented to an operation, which would attempt the removal of the steel. At 11 o'clock of the same morning, in company with Drs. Irwin, Throckmorton and Wetherill, we repaired to his home. A four per cent solution of cocaine had but very little effect upon the inflamed eye. A much stronger solution was used, and within ten minutes after the first instillation of the stronger solution the eye yielded to its influence.

An incision, involving one-sixth of the corneal circumference, was made downward with a von Graefe cataract knife. An electro-magnet was introduced, but upon making gentle traction I found the foreign body to be very firmly embedded. There were the dangers of bringing the iris with it, and of luxating the lens. The latter danger was certainly well grounded, as revealed by subsequent ophthalmoscopic examination. There-

fore the magnet was laid aside. I then introduced Liebreich's rotating iris forceps, and after a few minutes of gentle teasing the piece yielded and was withdrawn, the iris remaining in place. The cornea was unscratched.

A perforation, which persists to the present day, was left in the iris corresponding to the former seat of the steel. As it has healed, the perforation he will carry through life.

The recovery was uneventful. Every night preceding the operation since the iritis first developed, he suffered intense pain, which neither morphine nor cocaine relieved. The first night succeeding the operation he passed the entire night in sound sleep, not evincing the slightest pain. The inflammation subsided, and the vision is $\frac{15}{xv}$ in each eye.

The piece of steel proved to be three-sixteenths of an inch long, and quite irregular. The thickest portion was the part which showed in the iris, and was as Dr. Heath describes. The rest of the piece lay behind the iris, and in contact with the lens capsule. The piece was unfortunately lost in the bustle of cleaning instruments and returning to the office.

Present Condition.—He has had no attack of iritis since the operation. There is a small hole in the iris where the steel lay. The pupil is ovoid—the small end of the ovoid corresponding to the former position of the steel. In other words, the bridge of iris sags at this point, which may be due to the loss of control which the sphincter has sustained, because of the loss of a foundation at this point; or it may be paralyzed because of being unused for twenty-seven years. Ophthalmoscopic examination reveals a spot upon the lens capsule, where the steel had been embedded. This justifies me in the belief that it was best to lay aside the electro-magnet, and resort to gentle teasing to dislodge the piece.—*Indiana Medical Journal*.

CLINICAL HISTORY OF A CASE OF SUCCESSFUL
EXTRACTION OF A PIECE OF STEEL FROM
THE IRIS AND LENS BY AN IRIDECTOMY,
WITH SUBSEQUENT ABSORPTION OF
THE LENS AND RECOVERY OF
NORMAL VISION.¹

BY CHARLES A. OLIVER, M.D.,

Attending Surgeon to Wills' Eye Hospital, Ophthalmic Surgeon to the Presbyterian
Hospital, Philadelphia, etc.

On the second day of March, 1891, H. M., æt. 29, a blacksmith, came to Wills' Eye Hospital complaining that his right eye had become inflamed from the supposed lodgement of some foreign substance in the cornea one day previously. Attempts at extraction had made the eye very painful, which was relieved by the use of a weak infusion of tea-leaves. Two years previously the same eye had been struck by a piece of steel, measuring roughly about four millimeters square, the foreign body not penetrating the eye, although leaving the organ irritated for several days' time. Subsequently vision was in no way disturbed, and the organ had never become troublesome up to the time of the second accident.

At the time of the first examination of the second traumatism a small mass of foreign substance was found embedded in the upper inner quadrant of the cornea, about three millimeters above the horizontal meridian, and in almost identical position in the underlying iris, there was a round black bead of about the size of the head of a small pin, from the upper part

¹Read in the Section of Ophthalmology at the Forty-Third Annual Meeting of the American Medical Association, held at Detroit, Michigan June, 1892.

of which could be seen, by strong oblique illumination, a line of metallic-like lustre. A faint deposit of precipitates on the membrane of Descemet, with slight pericorneal injection, existed, though there was no evidence of any ciliary tenderness. Vision with this eye has fallen to slightly less than one-eighth ($\frac{5}{XL}$?), and the accommodative range was limited to the reading of type 0.75 D., from thirteen to thirty centimeters. Through the undilated pupil the eye-ground could be fairly seen, it appearing healthy. No abnormality could be noticed in the left eye, its vision being one, one and a halfths ($\frac{5}{7.5}$), and its accommodative range for 0.50 D. type, extending from thirteen to thirty-six centimeters.

The foreign substance was removed from the cornea, and upon consultation with Dr. Wm. F. Norris an immediate iridectomy, including the piece of supposed metal, was advised; the latter procedure, however, the patient refusing to accept. Upon this decision a soothing collyrium of boric acid and a Liebreich bandage were ordered, with a request that he should report in the morning.

Upon the following day the patient returned to the hospital stating to the resident surgeon, Dr. M. W. Zimmerman, that an exacerbation of pain in the eye during the night had decided his willingness to return for the operation. He was immediately put to bed, his bowels were purged, the eyes were bathed freely, and he was kept quiet until the next clinic day, March 4, when, upon re-examination, the anterior chamber was found somewhat shallow, and the lens was slightly swollen and becoming opaque in the position of the situation of the foreign body.

At this time the iris tissue in the vicinity of the traumatism was noted as muddy in appearance, with the formation of a synechia at the upper pupillary edge, the ciliary region being slightly tender to the touch. In spite of the appearance of these inflammatory conditions, a narrow incision, at a position in the cornea just inside of the limbus, corresponding with that of the foreign body, was made with an angular keratome, and an iris forceps passed in and the object, a flat piece

of steel of about one millimeter in diameter, with the surrounding bruised iris tissue, grasped, brought out and excised, making a clean iridectomy. The lens area exposed to view showed the point of the original wounding of the capsule, with the situation of the greatest amount of swelling and opacity. Atropine and a light pressure bandage were applied, and the internal administration of small tri-daily doses of calomel, with rest in bed, were enjoined. In two days' time the wound in the cornea had healed, the inflammatory symptoms had greatly subsided, and the lens matter had begun to rapidly absorb, until on the eighteenth day of the month there was but one piece of lens material to be seen; this being situated in the lower portion of the anterior chamber. Eleven days later the remaining lens mass had disappeared, the eye was quiet, and vision could be brought to almost normal by the use of a + s. 11 D. lens.

At the present time, about fifteen months after the accident, there is a perfectly quiet eye, with a narrow coloboma up and in. An eye which, in spite of a few fine linear capsular folds at the lower inner border of the pupil, which can be barely recognized during moderate pupillary dilatation, and a narrow concentric peripheral ring of lens and capsule debris, which can only be seen at the periphery of the coloboma, possesses normal acuity of both central and peripheral vision; the patient having an acuity of ($\frac{3}{5}$) with + s. 11. D. + c. 0.50 D. ax. 100°, and reading many words of type 0.50 D. readily, and all of type 0.50 D. fluently, at eight inches distance, with an additional convex lens of four diopeters strength.

The case is interesting on account of the immediate curative effects of an iridectomy which removed an offending substance and its bed of bruised and inflamed iris tissue, thus allowing a free rapid swelling and disintegration of lens matter to take place uninterruptedly during a watchful and careful after-treatment; this immediate happy result being supplemented by a subsequent restoration of vision to full acuity, with but little necessary correction of astigmatism in a comfortable and unirritated organ.

SPECIAL OFFER.

DR. S. C. AYRES' OCULISTS' INDEX RERUM.

This excellent Record-book, designed by Dr. S. C. Ayres, and published by J. H. Chambers & Co., ought to be in the hands of every oculist; especially the younger men in the profession cannot but find it of incalculable value, whether they simply record their cases properly for their own information, or for future use in scientific reports.

The book does not cost any more than any other record-book of much less value, and to introduce it more effectively, the publishers will sell it to subscribers of this journal for \$2.00, instead of the regular price of \$3.00.

It needs only to be seen and examined to be appreciated. As before stated, no oculist should be without it.

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

OCTOBER, 1892.

No. 10.

ORIGINAL ARTICLES.

THE CONSTRUCTION AND USE OF THE OPH- THALMOMETER—AN EXPLANATION AND A CORRECTION.

BY SWAN M. BURNETT, M.D., PH.D., WASHINGTON, D. C.

As the first account, in English, of the construction and use of the ophthalmometer appeared in my Treatise on Astigmatism published in 1887, it seems like going back to somewhat ancient history to bring it up now; and I should not again obtrude it upon a professional public, who have of late been treated to quite an avalanche of papers *pro* and *con* as to the value of the instrument, were it not that that description contains an important error which has not only escaped detection hitherto, but has been perpetuated in other places. So far as I know that is the only description in an English book which gives in any considerable detail the optical principles on which the instrument is constructed, and it is important that those who are studying the apparatus should be correctly informed regarding the arrangements and relations of the parts so as to

have an intelligent conception of the phenomena observed¹.

As the ideas in respect to what the ophthalmometer really does seem to be very vague, not to say incorrect, even among those who are using it regularly in practice, it should be understood, in the first place, that its underlying principle is the measurement of the radius of curvature of the cornea by means of an image reflected from its surface. If you know the size of the object, the size of the reflected image and the distance of the object from the reflecting surface, you have all the data at hand for the determination of the radius of a convexly curved surface. Javal's instrument is simply a convenient means for attaining this end.

As the chief, not to say the sole, use of the instrument is for the detection of corneal astigmatism, what is really to be determined is the difference in the curvature of the two opposite meridians, and this is made manifest to the eye of the observer by a difference in the size of the corneal reflection in these two meridians. The optical law is that the surface or meridian of greatest curvature (shortest radius) shall give the smallest image and that of the least curvature and longest radius the largest image; and the instrument of Javal is so constructed as to enable the observer to measure this and the amount of difference in the two meridians at a glance. This it does by a doubling of the corneal image by means of a prism. When the corneal image is 3 mm. in diameter and the telescope is properly adjusted, the edges of these two images, produced by the prism, are in contact, and, conversely, when they are in contact they must each have a diameter of 3 mm. When the double images are separated the corneal image is smaller than 3 mm., indicating a stronger corneal curvature, and when they overlap it is larger than 3 mm. with a greater corneal curvature. In the instrument the lateral boundaries of the object whose

¹I find, since writing the above, a full account of the optical principles of the ophthalmometer in the last edition of Dr. F. Valk's "Errors of Refraction." He does not fall into the same error that I did, but he accepts the old and incorrect index of refraction (1.35) for the cornea in constructing his table of Dioptry Reciprocals.

corneal image we measure are two white bands (or mires) one of which is graded in steps, and it is so arranged that the amount of over-lapping, when there is any, can be read off on these steps, each one of which represents a dioptre of refraction. And it is just here that the error into which I have fallen comes in.² On pages 130 and 131 of my treatise I say: "Moreover the meridian in which there is a crossing of the bands is the less refracting. The fact of the two images overlapping shows that they have a diameter greater than 3 mm., and consequently the surface giving them must have less curvature than that giving them with the edge in contact, and in order to have them thus in contact the object must be made smaller by moving M' on the arc toward M. If the images of the bands separate in moving the arc from its initial position where they are in contact it shows that the first meridian is the less refracting with a larger radius of curvature." On page 130 in the description of Fig. 38 the same fact is stated, "A, the meridian of greatest curvature, B, meridian of least curvature (longest radius)."

All these statements are correct as regards the instrument as Javal first constructed it, and as it was described by him and also by Gavarret in an article in the *Revue Scientifique*, 15 Juillet, 1882. But when we come to apply these principles to the instrument as now made we find that they do not hold in practice, for we have the *crossing* of the bands in the meridian of *greatest* curvature where the corneal image is the smallest. For instance, the bands being in contact in the horizontal meridian, if the arc is turned to the vertical meridian and there is a crossing of two steps, that signifies that we have an astigmatism of 2D, according to the rule, in which the vertical meridian of the cornea is the most strongly curved and most highly refracting. This seems in direct opposition to the proper optical theory, for in accordance with this, the image being smaller they should separate. This they do, but by the new

²For calling my attention to it I have to thank one of my former pupils, Prof. D. K. Shute, M.D., of this city.

arrangement in the later instruments as the image grows smaller the adjacent bands encroach one upon the other as is readily understood from the accompanying figure.

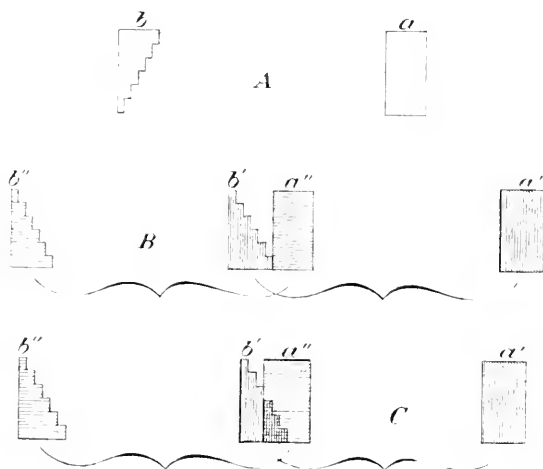


FIG. 1.

In A we have the object $a\ b$, the band a , which represents one end being rectangular, the other end b having gradations in steps. This is as it appears, one the arc of the ophthalmometer as seen by the examin  . When the cornea is viewed by the observer through the telescope and prism,—the arc being in a horizontal position — the two images of the corneal reflection are seen inverted in the relative positions as shown in B, where $a'\ b'$ is one image and $a''\ b''$ is the other. The inner side of a'' is in contact with the inner side of b' . The distance between the inner sides of each of these images is 3 mm. when the instrument is properly adjusted. Now let the arc be turned to the vertical meridian which is the more

strongly curved and more highly refracting. According to the optical law, the images $a' b'$ and $a'' b''$ should be smaller, and a' should approach b' and a'' should approach b'' , and in doing this of course a'' and b' will overlap as shown in C. And this is how it comes about that we have a crossing of the band in the meridian of shortest radius, greatest curve and highest refraction.

My mistake undoubtedly arose from the fact that I wrote the description after studying Javal's first papers, and did not notice, in reading his subsequent articles, the change he had made in the disposition of the bands. Originally he had the outer side of b'' to be applied to the outer side of a' in the horizontal position which would of course be attended with a separation of a' and b'' when the arc was turned to the vertical position.

The same mistake into which I have fallen has been committed in several treatises and articles written on the instrument that have appeared since the publication of my treatise.

The recently issued work of De Schweinitz has this statement on page 128: "If the image overlaps in the vertical meridian the radius of course is longer in this meridian and there is astigmatism. If the image separates with the bar vertical, this meridian has a shorter radius than the horizontal." This is, of course, exactly the opposite of the true condition of things. In his text book, Noyes, while giving the correct method of reading, offers no explanation of the principles involved and, besides, is somewhat confusing as to the exact position of the arc, since in one place he speaks of the index of the instrument indicating the position of the arc (the index being at right angles to the arc) and in another of the direction of the arc itself as if they were identical. Würdemann, in a paper published in the *Journal of the American Medical Association*, for August 27, 1892, copies my erroneous statements entire. Koller, in a paper published in the same journal for September 13, 1890, and which purports to give a full and complete description of the instrument, while stating the optical principles correctly, not only makes the same blunder

as to the practical application, but illustrates it with a drawing which is exactly the reverse of what it should be for the instruments now in use and which he figures.

It should be remembered that the only thing the ophthalmometer can do is to give data for calculating the radius of corneal curvature. It does not even give us the refraction of the cornea for this can be known accurately only when we have in addition the index of refraction of the corneal tissue³ and the aqueous humor. In Javal's first paper (*Ann. d'ocul.*, Juil., Aout 1881), he assumed this to be 1.35 and his values for the corneal refraction there given are based on this index. He afterward took what is now accepted, I believe, as the true index, 1.337, but has not, I think, published a revised table. I have myself constructed a table of reciprocal values in refraction on these data⁴ which makes them correspond to the reading on the arc of the ophthalmometers now in use.

It would seem from some recently published papers that this really valuable and necessary instrument is in danger of suffering at the hands of a few of its enthusiastic champions, who are claiming reliance upon it to an extent which certainly my experience will not justify. It will not allow us to dispense with the use of a mydriatic in all cases, nor is any one warranted in ordering cylinders in accordance with the reading of the instrument without having verified these readings by other methods. The final resort, as I have always maintained, must be lenses and test-types.

In the majority of cases the corneal astigmatism as shown by the ophthalmometer is the total astigmatism of the eye making allowance for the 0.5 D. astigmatism of the lens, con-

³Some one has written of the posterior surface of the cornea as a possible factor, but it should be remembered that the corneal tissue and the aqueous humor are of nearly the same index, and that irregularities of the posterior surface of the cornea could play no important part in changing the refraction.

⁴An analysis of the refraction of 576 healthy human corneæ examined with the ophthalmometer by Javal-Schiöt, "Transactions of the American Ophthalmological Society," 1888.

trary to the rule, but in an important minority it is not; and the longer I work with the instrument the more important a factor I find lenticular astigmatism to be.

The ophthalmometer is a great instrument, but like all other great things, it has its limitations, and we should not, in our admiration, allow these to be lost sight of.

SELECTIONS.

THE PRIME ETIOLOGICAL FACTOR OF GLAUCOMA IS CONSTITUTIONAL.¹

BY S. O. RICHEY, M. D., WASHINGTON, D. C.

This paper will be occupied with the presentation of one idea, for a *resume* of the literature of glaucoma would unprofitably occupy much space, as so much has been written offering diverse views of its different features, each with a show of reason.

Mr. Jonathan Hutchison, in the Bowman Lecture, 1884, discusses the relation between certain diseases of the eye and gout. The tissues of an individual long subject to the causes of gout may become modified in such a way that they are liable to suffer in a peculiar manner when exposed to the ordinary causes of disease; the *nervous* and *vascular* systems are specially so disposed. Rheumatic gout may have such a relation to true gout, and he names "hot eyes," calcareous bands of the cornea, arthritic iritis, relapsing cyclitis, *glaucoma*, and retinitis hæmorrhagica as having such connection; and asks if it can attack any of the *structures of which the nervous system is composed*.

In the London *Lancet*, January 1873, he describes an iritis occurring at an early age, differing from other forms of arthritic iritis, in being persistent and insidious, rather than paroxysmal. Without any attack of acute inflammation, adhesions quietly form between the iris and the capsule of the lens.

¹Read at the meeting of the American Ophthalmological Society, July 20, 1892.

* * * This affection usually begins in but one eye, and advances to almost entire loss of vision in it, before attacking the other. It is insidious, and for the most part painless, but is liable to exacerbations and periods of improvement. It is remarkably intractable, prone to attack both eyes, and to end in blindness.

Such is the position of an acute observer as to the influence of gout upon the eye.

The question as to the *cause* of increased tension is still open, whether due to the *too rapid infiltration*, or to *impeded excretion*, with a leaning to the latter.

Opposed to Mr. Priestley Smith's theory, that "glaucoma of every form is essentially a disease of retarded excretion,"² are the conclusions of Schnabel,³ supported by clinical and pathological studies, that "glaucoma may be present without obliteration of the sinus of the anterior chamber; that the latter can exist without glaucoma; that glaucoma can be cured without obliteration of the sinus of the chamber being removed."

"It has been proved by Mr. Windsor,⁴ of Manchester, that acute glaucoma may occur where there is congenital absence of the iris."

A doubt, which reaches almost a denial, is general as to whether excavation of the disc is due to pressure, or not. In Rydell's case, blind from acute glaucoma of three weeks' standing, *without excavation*, pain was relieved and tension reduced, but vision was not improved. Mauthner⁵ claims that: "We find in the beginning of an excavation that pressure frequently is not increased. I have recently examined the left eye of a patient, in which there is the beginning of a pressure excavation, of which there was not the slightest sign a year ago, when I saw him for paresis of one of the muscles. The functional disturbance is extraordinary, and shows itself in transitory obscurations; central S. is less than in R. E., which has S=" v1, while with L. E. a few letters of 6 are not seen at 6 m. distance. Without glasses the patient, who is forty-five years old, reads with R E., J. 2, with the left eye J.

3. F. undisturbed. The well known appearance of the vessels is very marked at the upper lateral edges of the papilla. T. is precisely the same in both eyes, and falls even below the physiological maximum. Would such a pressure produce such a picture?"

"Some morbid process has attacked the intra-ocular end of the optic nerve, causing a diminished resistance (softening) of the lamina cribrosa, so that it yields to even normal pressure in the eye, but at the same time there is going on in the optic nerve and alteration, which has the greatest resemblance to that in the lamina cribrosa, and leads to a softening, to a giving way of the supporting connective tissue."⁶

Reading these comments on glaucoma with a free mind, our previous ideas are subverted, because we must conclude that increased tension is not necessary to excavation; that excavation is not always present, even when increased tension has existed sufficiently long to produce it; that excavation may result from "some morbid process" in the nerve, lessening its resistance; that increased tension is not dependent upon obstruction of the channels of excretion.

If the last proposition be true, that increased tension is *not* dependent upon obstruction of the channels of excretion—and Schnabel supports his conclusion by dissections of the organ which he had observed while affected with the malady—then increased tension *must* be caused by too rapid infiltration, or secretion. Schnabel argues further,^b that glaucoma is a disease of the bloodvessels of the eye, which develops either gradually, or at once, in the region supplied by the long anterior and posterior ciliary arteries, the central bloodvessels, and those of the sclerotic circle; that the disturbances of nutrition and function are the direct result of these disturbances of circulation, etc.

Mr. Priestley Smith's theory was obviously derived from the study of glaucoma of local origin; and yet, as Mr. Brailey, of London," says, "it fails to account for temporary glaucoma, for glaucoma without the characteristic application of the iris, for glaucoma in young persons, for one sided glaucoma, glauco-

ma in aphakic eyes, and especially for cases where a traumatic dislocation of the lens backward has been quickly followed by increased tension. It does not, also, explain the *invariable inflammation* and *atrophy* of the ciliary body and optic nerve."

To the theory of increased secretion, or more properly too rapid infiltration, a *vis a tergo*, some derangement of the general system, is a *sine qua non*. The uric acid diathesis, of which gout is a characteristic feature in many instances, offers the most satisfactory explanation; true gout, of acute inflammatory glaucoma; rheumatic gout, of chronic simple glaucoma.

In nearly all particulars acute gout of the toe and acute inflammatory glaucoma are alike. Observe the points of resemblance. (See Table, next page).

Thus, each may be inherited and have the premonitory symptoms; the attack is sudden and at night; in each it is characterized by great pain, engorgement, and tension, followed œdema and exfoliation; duration, from a few days to a few weeks; recurrence of the affection, possibly to attack the other side, or to become chronic. No pus.

Such is the clinical picture.

That acute inflammatory glaucoma is more frequent in females, and gout of the great toe more frequent in males, may be due to the greater emotional tendencies of women; for, according to Schweigger "mental emotion and loss of sleep favor acute glaucoma."

While women derive a certain immunity from podagra by reason of menstruation (Hippocrates), yet at the approach of the climacteric, a period of greater or less tendency to vascular cerebral disturbance, arising from the intermittence of the derivative action of this function, acute inflammatory glaucoma is most frequent, and chronic simple glaucoma develops.

"The great toe"¹⁰ contains a considerable amount of tissues peculiarly liable to become the seat of the deposition of urate of soda; as, for example, the cartilages and ligaments, tissues having either little vascularity, or nourished independently of bloodvessels; the great toe being very remote from the heart,

TABLE.

ACUTE INFLAMMATORY GLAUCOMA.

1. An inherited tendency.
2. Most frequent after the period of presbyopia.
3. First attack is usually in cold weather.
4. Premonitory symptoms: Impaired A.; premature presbyopia, increased H.; halo, rising clouds or smoke, heaviness of brow, shooting pains in the eye, increased tension. These may be so slight as to cause no anxiety.
5. Sudden seizure, usually at night.
6. Constitutional disturbances; febrile excitement, with some nausea and vomiting.
7. Circumorbital pain, peri-corneal and sub-conjunctival injection, slight protrusion of globe, sluggish, dilated iris; cornea dull and anæsthetic, humors greenish, ischæmia.
8. As the attack passes off there is great chemosis, lachrymation, and photophobia. The cornea becomes roughened.
9. The inflammatory attack passes off in a few days or weeks.
10. The disease is not arrested: there may be a recurrence of acute inflammatory attacks, chronic inflammatory exacerbations, or the disease may progress insidiously.
11. No pus.
12. Urine. ?
13. No analysis of aqueous humor, so far as I know.
14. The disease may attack first one eye and then the other.
15. Occurs most frequently in women.

ACUTE GOUT OF THE GREAT TOE.

1. An inherited tendency.
2. Most frequent after the beginning of senile changes.
3. First attack, usually in winter, or spring.
4. Premonitory symptoms may be so slight as to pass unnoticed, or may be very distressing.
5. Attack is sudden, usually between two and five o'clock in the morning. (Garrod).
6. Chilliness, heat of skin and perspiration, thirst, loss of appetite, a white tongue, constipation, and restlessness.
7. Toe is swollen, red, hot, and exquisitely tender. Veins proceeding from the toe are turgid with blood, and the joint is stiff. Great tension of the skin.
8. As the attack passes off there is pitting of the skin (œdema), then desquamation.
9. Duration, from four days to three weeks.
10. Gout recurs, and the frequency of the paroxysms increases.
11. No pus.
12. Urine scanty, high-colored, and deposits a colored sediment on cooling.
13. Synovia contains urate of soda.
14. Gout not uncommonly seizes first one great toe, then the other.
15. Is rare in women.

the circulation is weaker there. * * * The reasons for the great toe on one side of the body being affected apply equally to the other; and hence, the disease not uncommonly attacks first one toe and then the other, within the short space of a few hours or days."

Anatomically, the eye is an extremity of the body, not quite so far from the heart as the toe, and is exposed to variation of temperature and to injury; the sclerotic, the cornea, and the tendons of the extrinsic muscles are of dense fibrous tissue, with little vascularity; the stroma of the choroid and iris is of reticular connective tissue, supporting pigment cells, blood-vessels, etc., the zonule of Zinn is a *fibrous* perforated membrane, the lense capsule is a structureless membrane, the corpus vitreum depends upon bloodvessels not its own for nutrition, and contains mucin, and (Picard) 0.55 per cent. of urea, and about 0.75 per cent. of sodic chloride. The posterior surface of the iris and ciliary body secrete the aqueous humor (synovia?) which contains a small amount of albumin, sugar, and sodic chloride, equal to $\frac{1}{50}$ of its volume.

With increase of blood-pressure and intra-ocular pressure, there is increase of albumin and the production of fibrin in the anterior chamber. (Jessner and Grünhagen.)

Taken with the fact that a local derangement, as a dislocated lens, does not seem sufficient to cause the *whole* train of symptoms, general as well as local, called glaucoma (though it may precipitate an attack which would probably have taken place at the latter date), the clinical history of a seizure and the anatomical peculiarities of the regions under consideration present a picture of such mimicry as we find nowhere else repeated. The crucial test, the presence of urate of soda, I have had no opportunity to apply since recognizing the resemblance.

To again read Garrod,¹¹ "The impure state of the blood, due the presence of urate of soda, is probably the cause of the disturbance which often precedes the gouty paroxysm; that is; of the so-called premonitory symptoms. Urate of soda in abnormal quantity in the blood is essential to an at-

tack of gout, * * * but does not constitute gout; * * * that the amount of deposited urate of soda is not in proportion to the intensity of the inflammation, and that in some the infiltration may ensue and give rise to scarcely any inflammatory action. * * * The inflammation of the gouty paroxysm tends to the destruction of the urate of the soda in the blood of the inflamed part, and probably of the salt also which is thrown out." Soelberg Wells¹² observes that "males who are attacked by glaucoma frequently suffer from gout, or disorders of the digestive organs;" of primary glaucoma, "when once the one eye has become affected with glaucoma there is great tendency in the disease to invade the other also."

Mr. Hutchinson¹³ asserts that "all forms of rheumatism, and all forms of gout, are included in the common term, arthritic. But we cannot limit the term to the joints, as its etymology might seem to require, but must allow it also to apply to certain affections of the muscles, fasciæ, tendons and other fibrous structures which have been proved to be dependent upon the same peculiar state of health. * * * Under the term rheumatism we include all arthritic maladies which are not proved to be gouty. * * * I must protest, at once, against any attempt to limit the term gout to cases in which attacks of acute inflammation of the great toe occur. * * * Rheumatism differs from gout in being of *nerve* origin, and due to reflex disturbance of nutrition; * * * it is, according to my hypothesis, the basic diathesis to which a small minority of cases of gout is superadded."

The younger Garrod says that rheumatic gout lacks the distinguishing feature of gout, urate of soda.

Many of the manifestations of rheumatic gout are associated with chronic glaucoma. viz.: enlarged or distorted joints, a peculiar senile pallor, or muddiness of the skin; periods of mental depression, and other symptoms, attributable only to changes in the nervous system. I have found nowhere any reference to pathological alteration of nerve tissue in gout although the existence, character, and specific cause of such changes, which are *presumed* to exist because of the nervous

symptoms present in lithiasis, would have an important bearing upon the subject in hand, as explaining the structural changes in the lamina cribrosa and the intra-ocular end of the optic nerve, the condition of diminished resistance associated with excavation without increase of tension, in cases of chronic glaucoma.

Dr. W. W. Johnston,¹⁴ Washington, D. C. published some thoughts "On the Nature and Treatment of Forms of Disease characterized by Indigestion, the Presence of Bile, Urates, and Uric Acid in the Urine, and by Nervous Symptoms," which suggest a possible cause and explanation of the nerve changes in chronic glaucoma. In his own words, "The question of the continuous production of toxic substances in the intestinal canal in health, and the protection of the organism by the absorption of poisons in alterations of the gastro-intestinal tract, was developed in detail by Professors Albertoni and Silvia at the meeting of the Fourth Italian Congress of Internal Medicine, held in Rome. Professor Silvia enumerates the following substances as probable poisons; peptoxine bases (ptomaines and leucomaines), idol, phenol, lactic acid, ammonia, sulphuretted hydrogen, acetone, etc. The direct proof of the fact that the nervous phenomena in such cases are due to the absorption of toxic matters from the intestines is not yet found, but the argument is a forcible one. The existence of indigestion is known by the symptoms; the presence of toxic matters in the intestine in health is proved. * * * The relationship of acute indigestion and nervous disturbances, and the association of fermentative dyspepsia with nervous symptoms, and an excess of these products in the urine and faeces, give sufficient grounds for adopting this theory as reasonable."

Dr. Johnston has given much attention to the subject of digestion, and if a reference to his able paper will induce those who have the care of cases of chronic glaucoma to read it, it will probably divert attention from glaucoma, except as a local manifestation of a general malady (although he does not refer to glaucoma), broaden the view of the subject, and en-

able us to comprehend the changes in nerve tissue going on elsewhere in the system in rheumatic gout, by that which takes place in the intra-ocular end of the optic nerve, exposed to observation, in chronic glaucoma.

Returning to the subject of intra-ocular tension, Mr. Priestley Smith¹⁵ claims that "high tension depends more upon an excess of blood in the eye than upon the excess of intra-ocular fluid," while Dr. Spender¹⁶ has observed, as early symptoms of arthritis, increase of pulse rate with high arterial tension.

Mr. Hutchinson¹⁷ concludes that "it is probable that there are many different forms of inflammation of the eye, or of parts of it, which are in connection with gout. They may be divided into groups: *a*, those which go with acquired, humoral, or renal gout; *b*, those which depend upon inheritance of structures damaged, or, at any rate specialized, by gout in predecessors. The difference between the two classes of affections is very marked. In the one, attacks of a transitory nature are the rule, and the attacks are often acute and attended by much pain. In the second group, although a tendency to temporary recovery and recurrence is often observed, yet, there is a great proneness to chronicity, and persistence. The invasion is often insidious, but the disease is usually in the end destructive."

If the difference between the forms of acute inflammatory and chronic simple glaucoma had been in the mind of Mr. Hutchinson the description could not have been more effective than in the specification of the two groups named above.

His address will bear reading with this thought.

Ordinarily, when both eyes are attacked by the same disease process, we rationally conclude that the cause is constitutional, and do not treat an expression of the dyscrasia, but rather its cause.

In chronic glaucoma, a local manifestation is treated (for, sooner or later, both eyes are attacked), and then we wait to see what "turns up," with about the results presented by Dr. Bull,¹⁸ of New York, to the American Ophthalmological Society, in 1889; in the detailed history of ninety cases of chronic

simple glaucoma, subjected to the operation of iridectomy, during a period of seventeen years. The paper is most interesting and instructive, especially the summing up: "One hundred and fifty-four operations were done on the one hundred and eighty eyes under consideration. Vision was temporarily improved by iridectomy in both eyes in two cases, and one eye in six cases; but in all eight cases, after a few months, a steady loss of vision and narrowing of the field set in, and continued progressively as long as the patients were under observation.

"Vision remained unchanged, neither better nor worse, after the operation, for a period of one year or longer, in both eyes in eight cases, and in one eye in twenty cases.

"Vision grew slowly and steadily worse after the operation, in both eyes in forty cases, and in one eye in twenty-nine cases.

"Vision grew rapidly worse after the operation, in both eyes in two cases, and in one eye in eight cases."

He concludes that "the health and age of the patient exert a decided influence upon the operation, and any marked evidence of senility is distinctly unfavorable to the operation."

Dr. Gruening,¹⁹ of New York: "In cases of chronic glaucoma with degenerative changes, neither iridectomy nor anterior sclerotomy will give the patient the desired relief; posterior sclerotomy *may do it at times*."

Mr. Power,²⁰ of London: "In cases of chronic glaucoma no operation is of much service." This terse statement, it seems to me, covers the whole ground.

The good results of operation in chronic glaucoma are in comparatively small ratio, and are therefore accidental, and not scientific; for it often precipitates disaster by additional irritation. So long as the two chief clinical characteristics of glaucoma, increase of tension and excavation of the disc, are not satisfactorily explained, the management of such cases must be empirical. The author of iridectomy for glaucoma acknowledged it to be empirical, and only experience has taught us in what cases it is of most value, those of acute in-

inflammatory glaucoma; for here it saves the eye until another time; it does not cure the disease. Dr. Bull's statistics do not teach us to do iridectomy in chronic glaucoma, cases of which form of the disease are in excess of any other, unless upon the plea of *dernier ressort*—because we know of nothing better. They indicate that the majority of eyes are worse after an operation; in a few the *status quo ante* is maintained; in a still smaller percentage there is some improvement. With this diversity of result, who, save in the occasional case of *immediate* gain, or loss, to the eye, can say what influence is attributable to operating? Might the case not have done just as well without interference? Is the surgeon justified in a feeling of certainty that he has done a service? If all such cases followed *approximately* a given course he would have a guide; but they vary so much. If it progresses slowly after an operation, it might have done so without it. If it remains stationary for a time can that be attributed to operation? If the patient goes rapidly blind, has he a right to reproach the surgeon? In operation is *possibility*, not *probability*. In simple glaucoma it has a questionable rationale, and experience teaches that, if done at all it must be done with caution. It is double-edged, and may cut either way.

It is a prime necessity that a quiet, healthy, out-door life should be led, apart from occupations of much nervous excitement, causing loss of reserve force; that a condition of self-possession should be maintained; that the dietary should be regulated as to time, quantity, and quality; for over-feeding and bad feeding is a conspicuous vice of the age. In adult life the effort should be to preserve the balance between waste and repair, and to see that both processes are normal. This is a duty which the family physician may share.

As such cases pursue so chronic a course, it would seem wise to discover the constitutional cause, and to begin with that, instead of with the last expression of the disease, leaving the cause in action.

Rational management of the disease involves a study of the general condition and a correction of all the habits of the

individual. This is difficult, but our function is advisory, and each sufferer must "work out his own salvation" with our guidance.

By controlling the quantity of food productive of uric acid and by reducing the whole quantity to the possibility of easy digestion and assimilation, thus lessening the amount of toxic substances in the intestinal tract; by the regular entire excretion of what is excessive by way of the kidneys and bowels, harm in this way is obviated. Tonic aperients (not irritants), which encourage natural action of the intestines, serve a good purpose when used with judgment. Hunyadi water, taken at bedtime, lies in the track all night, does not purge, but by its solvent power prevents accretions. Nothing should be done to lessen the digestive power, and a quantity of food should be taken, small enough to *insure* its digestion and proper disposal. Anything (as coffee) which retards digestion must be rejected for obvious reasons.

Salicylate of phenol, it is claimed, has been found in the joints of gouty persons taking it; therefore its purpose is apparent.

Lithia waters secure the excretion of some uric acid; piperazine, a new synthetical compound, is recommended as having twelve times the solvent power of lithia upon uric acid. Strychnine acts by stimulating the functional activity of all the organs of the physical economy.

Galvanism, if properly and steadily used, is profitable. After ten minutes' use of two milliamperes direct current to the sympathetic, in an ordinary case, ocular tension is lessened the pupils seem more active, and the patient becomes calm, often almost falls sleep. By the experiments of Onimus and Legros²¹ it has been shown that if the direct current (positive pole at the nerve center) be employed, the circulation is augmented; within a few moments the arteries have increased in bulk, and the whole network of capillaries is seen in great commotion. Faradization contracted the bloodvessels, but after a time contraction ceased, and the arteries became larger than before the application. The continuous current, on the

other hand, renders circulation more active, and reestablishes it when it has been arrested. The induced current produces spasmodic contraction of the unstriated muscle, while the continuous current produces a *vermicular* contraction (Bartholow). The latter thus favors the natural movement of the vessel, and while *directly* increasing the amount of blood passing, by reaction the amount of blood in the part supplied by the vessel is reduced to the normal. The object to be gained, stimulation of the cervical ganglia, the trophic centers of the region of the trigeminus, is accomplished as well with the cathode held in the hand as in contact with the affected region; yet, when placed on the temple, or above the eye, it has some additional *mental* effect, which is not undesirable.

The writer has endeavored to cover the ground as concisely as possible: to offer the salient points of a view of the subject he has entertained for several years, especially in regard to *too much food*. He thinks that in the hypothesis discussed we find the true etiological factor of the most intractable of diseases, chronic glaucoma; that acute inflammatory glaucoma is a paroxysmal expression of the same affection; that local irritation, or trauma, excites an attack of glaucoma only in the presence of the dyscrasia; that operation saves the eye during a paroxysm; that operation serves little purpose in chronic glaucoma, even when it does not, by irritation, hasten the disease process or precipitate a paroxysm; that chronic glaucoma is a neurosis—progressive atrophy with the feature of inflammation with deficient power, varied by periods of *seeming* rest; that correcting and controlling individual habits, especially in the *amount* and character of food taken, will do more to preserve vision than operation; add that there may be a possibility of aborting chronic glaucoma, if the tendency to it be recognized at an early stage.

LITERATURE.

- ²Trans. Seventh International Medical Congress, vol. iii, p. 84.
- ³Archiv. Ophthalmol., vol. vii, p. 14.
- ⁴A Practical Treatise on Diseases of the Eye, by Haynes Walton, London edition, p. 1170. See Ophthalmic Review.
- ⁵Von Graefe's Archiv, 1872, vol. xviii, pp. 1-51.
- ⁶Archiv Ophthalmol., vol. viii, p. 38.
- ⁷Vide supra, p. 39.
- ⁸Garrod, on "Rheumatoid Arthritis," Reynold's System of Medicine, p. 553; "In the early stage, when swelling is prominent, a considerable increase of synovial fluid is found, and the joint exhibits the same appearance as in case of ordinary inflammation. The lining membrane is often red from over-injection of the blood-vessels. If the bone is sawn through, it is often found spongy, and contains a large amount of *oily water*, from the occurrence of a *species of fatty degeneration*. N.B. All italics are my own.
- ⁹Archiv f. Augenheilkunde, vol. xv, p. 311.
- ¹⁰Trans. Seventh International Congress, vol. iii.
- ¹¹Reynolds' System of Medicine, vol. i, p. 533.
- ¹²A Treatise on Diseases of the Eye, 3d Amer. ed., 1889, p. 389.
- ¹³Trans. Seventh International Medical Congress, vol. ii, p. 92.
- ¹⁴The Medical News, March 12, 1892.
- ¹⁵Ophth. Rev. vol. vi, p. 196.
- ¹⁶Garrod: A Treatise on Rheumatism. Am. ed., 1890, p. 245.
- ¹⁷Ophth. Rev., vol. iii, p. 385.
- ¹⁸Trans. Amer. Ophth. Soc., vol. vi, part 2, pp. 246, 291.
- ¹⁹Ibid., 1889.
- ²⁰Trans. Seventh Internat. Med. Congress, vol. iii, p. 106.
- ²¹raité d'Electrode Medicale, Paris, 1872.

CONTRIBUTION TO THE SUBJECT OF INTRACRA-
NIAL LESIONS WITH DEFECTS IN THE
VISUAL FIELDS.—FIVE CASES
WITH AUTOPSIES.

BY CHARLES STEDMAN BULL, M. D.,

Professor of Ophthalmology in the University of the City of New York.

CASE I.—PACHYMEINGITIS OF THE CONVEXITY OF THE BRAIN, WITH EXTENSIVE ENDARTERITIS AT THE BASE.—A lady, aged fifty, presented herself in May, 1886, with the following history: Four years before, she had suffered with a very severe mental shock, brought on by the sudden death by an accident of two members of her immediate family. Previous to this she had always enjoyed a fair state of health, though she had never been strong. The sudden shock caused a series of convulsions, which ended in a profound condition of neurasthenia, lasting for more than five months before she began to improve. The nervous prostration was accompanied by a profuse menstrual flow, coming on every three weeks and lasting for twelve days. Somewhat less than a year later the vision of the left eye became affected, the first symptom being night-blindness. The amblyopia of the left eye progressed very rapidly, so that in less than three months she was unable to read the largest type with any glasses. With every recurrence of the uterine hæmorrhage the vision in the left eye became suddenly much worse. About a year ago the right eye became affected the same way, but not with the same rapidity, the first symptom being again night-blindness. She then began to suffer from headaches of a peculiar type, beginning at the vertex with a feeling as if a sharp instrument had been

driven through the skull, and had then been turned round in the brain, and she would shriek with the sudden pain. When I saw her in 1885 these headaches had changed in character and were of a dull, persistent nature and located in the occipital region. At that time the motility of the eyes was unimpaired, the irides and pupils were normal, and the media were clear. An examination of the eyes gave the following results: R. E., $20/\text{XXX}$, unimproved with glasses. Reads Jaeger 4 with sph. $+1\text{D. } 1.50$. Small positive central scotoma for form and color. Color sense normal outside the limits of the scotoma. Ophthalmoscopic examination negative. L. E., $2/\text{cc}$ eccentrically. Large irregular central scotoma. Total color-blindness. Neuroretinitis in the stage of decline, but without hæmorrhages or positive exudation and without papillitis. Optic nerve in the first stage of atrophy, with slight discoloration of the disc, and with the arteries and veins reduced in caliber. At times there is entire obscuration of the field of vision of the right eye, which always occurs slowly and as slowly disappears. The hearing was normal, the knee-jerks were normal, there was no difficulty in walking, and the dynamometer gave a fairly normal result. The urine was repeatedly examined, and showed nothing abnormal, save an excess of urates.

Under observation the vision in the left eye gradually sank to distinguishing the movements of the hand eccentrically, and the vision of the right eye diminished to $20/\text{LXX}$. The left optic disc became atrophied with indistinct outline. The patient was seen at intervals up to the spring of 1890, when she died. The headaches gradually returned with increasing severity and frequency, and she became at times mildly delirious. During the last year of her life she had repeated attacks of unilateral convulsions, mainly confined to the left side, but occurring occasionally on both sides, and she died in an unusually violent convulsion, which seemed to be general in character. This patient had never had syphilis or any symptom of tuberculosis, though the latter disease existed in her family.

The autopsy showed extensive pachymeningitis of the convexity of the left cerebral hemisphere, most marked over the

anterior lobe, with some patches over the anterior lobe of the right hemisphere, and one large patch, the size of a fifty-cent piece, over the parietal lobe of the right side, low down. All the arteries at the base of the brain were thickened and their lumen was narrowed, and this was particularly marked in the left anterior and middle cerebral arteries. The optic tracts and chiasm presented no microscopic changes. There was no exudation and no pachymeningitis at the base of the brain. There was no extravasation of blood anywhere within the brain.

The relation of cause and effect in this chain of symptoms seems difficult to unravel. We have to deal, first of all, with a sudden and violent mental shock, followed immediately by convulsions, and ending in profound nervous prostration. On recovering from this latter condition, menorrhagia set in, and was followed by night-blindness of one eye and gradually increasing loss of vision, with both subjective and objective central scotoma for form and color. Headaches then began, which were at first boring in character and located at the vertex, but subsequently became of a dull, persistent character, and were centered in the occipital region. Then the second eye became affected in the same way, while the first eye developed a neuro-retinitis which ended in atrophy. Then followed unilateral convulsions, transient attacks of amblyopia in the second eye, and, finally, a general convulsion, ending in death. Reasoning from the results of the autopsy, the endarteritis was probably already well developed at the time of the occurrence of the mental shock, which, in its turn, hastened the progress of the arterial degeneration and indirectly the development of the pachymeningitis. The neuro-retinitis was probably to be attributed more to the long-continued loss of blood than to the pachymeningitis of the convexity, for, though there was marked disease of the arteries at the base of the brain, there was no meningeal complication in this region. The occurrence of night-blindness as the first symptom of the loss of sight was unusual, as there was no extensive retinal lesion in the fundus, and none at all at the periphery. The

scotoma in the field of the right eye gradually increased in diameter until it reached 45° on the nasal side, 60° on the temporal side, 35° upward and 40° downward. The convulsions were probably the result of the vascular degeneration and the meningeal inflammation.

CASE II.—SARCOMA OF THE OPTIC CHIASM AND NERVES.—A young man, aged twenty-four, called on me in February, 1888, and gave the following history: For more than a year he had suffered from headaches, which were at first confined to the frontal region and were slight and transient. They, however, increased somewhat rapidly in severity and intensity, and involved the whole head; so that at times he felt as if his skull would burst. After about six months had passed there appeared muscular twitchings in the upper extremities and face, and occasional attacks of vertigo, but with no loss of consciousness. About the same time the vision of both eyes also became affected, as if a slight haze covered everything, and this gradually grew worse. Three weeks before I saw him, while he was in the third story of an unfurnished building superintending some work, a very violent headache came on accompanied by vertigo, and this was succeeded by a general convulsion, in which he fell to the ground, a distance of thirty feet, striking on his back and side. He was unconscious for a few minutes and then came to his senses, and after a while stood up and walked home, a distance of nearly half a mile, without assistance. This was his first convulsion and there has been none since. The headaches became constant and were at times very severe. An examination revealed nothing abnormal in the appearance or motility of the eyes. The irides and pupils were normal and the media clear. The optic nerves were very hyperæmic and the veins pulsated, but the outlines of the papillæ were clearly defined and the retinae were intact. There was no diplopia. The field of vision showed a slight concentric narrowing in each eye. Vision was 20° c in both eyes. The hearing was normal, and there was no tinnitus. The patient had never had syphilis, and appeared to be

in a good state of health. The urine was carefully and repeatedly examined, but nothing abnormal was found except a high specific gravity. It seemed impossible to make a satisfactory diagnosis, though, from the persistence and severity of the headaches, the muscular twitchings, and the convulsion, the presence of a tumor was suspected. Before I saw the patient he had had four partial tenotomies done for the relief of his headaches—three on his right eye and one on the left—but with no result. His refraction was hypermetropic, D. 0.75 in each eye under atropine. He had no astigmatism. Potassium Iodide was administered, and he was requested to report at the office once a week, which he did faithfully as long as he was physically able to do so. The vision slowly grew worse, and the concentric limitation of the fields gradually increased. The headaches continued in spite of the large doses of potassium iodide (sixty grains three times a day), and after two months it was discontinued, as he began to show signs of iodism. About three months after I first saw him the optic discs lost their hyperæmic condition and began to grow pale. Strychnine was then administered, but he was obliged to discontinue it, as it made his headache worse. Nearly five months to a day after I first saw him he had a violent convulsion, lasting nearly six minutes, and this was followed by a second some hours later, after which he never had another. The optic disc rapidly assumed an atrophic condition, the field grew very narrow in both eyes, and vision sank to 2 cc. He became very irritable, and this condition was followed very soon by a stupid, somnolent state, which gradually deepened into profound coma, in which he lay for nearly ten days before death came—about eight months after his first visit. The autopsy revealed nothing abnormal on the convexity of the brain, but the skull in the vicinity of the left fronto-parietal suture was very much thickened, and the dura mater was very firmly adherent to it. On attempting to remove the brain from the skull, a growth was apparently discovered at the base in the vicinity of the sella turcica. After much careful dissecting in the vicinity with the handle of the scalpel and the

finger, and division of the spinal cord as low down as it could be reached, the brain was removed, and it then became possible to study the location of the tumor. It was as large as a Brazil-nut, and involved very closely the optic chiasm, both optic nerves near the chiasm, and the hypophysis. It was moderately hard, with a smooth surface, and, on being divided, was seen to be of a grayish hue and of the same consistence throughout. The optic nerves just beyond the chiasm were flattened by the pressure of the tumor. The growth did not seem to extend backward into the optic tracts, nor upward into the hemisphere, but it had made a distinct depression in the under surface of both hemispheres. It was somewhat firmly adherent to the dura mater at the base. Macroscopically the tumor had apparently originated in the optic chiasm or in the connective tissue surrounding it. There were no other lesions discoverable anywhere in the brain after a most minute examination had been made. The tumor was carefully hardened and then examined microscopically. It proved to be a small cell sarcoma, tolerably vascular in character, with relatively great development of the connective-tissue framework. It could not be accurately determined whether it had originated in the hypophysis or in the connective tissue of the chiasm. The nerve-fibers were in many places entirely atrophied, and this was particularly noticeable in the origins of the optic nerves. There were no signs of meningitis or of neuritis, and the case seemed to be one of simple atrophy from compression. Papillitis or choked disc was conspicuous by its absence, which was an interesting point in the case. Another interesting fact was the very small number of convulsions which occurred in the course of the development of the tumor, and the long period—nearly six months—which elapsed between the first and second convulsions. The autopsy showed that no injury to the skull had been caused by the severe fall of thirty feet, and this corroborated the statement made by witnesses of the accident that he had struck on his back and side, and not on his head. No satisfactory attempt was made to locate the tumor before death, and not the slightest suspi-

cion was entertained that the growth involved the optic chiasm.

CARE III.—SARCOMA OF THE LEFT OCCIPITAL LOBE OF THE BRAIN; BILATERAL RIGHT HEMIANOPSIA.—In December, 1888, a gentleman, aged thirty-seven years, presented himself at my office with the following history: For the past seven months he had noticed a loss of vision in the right half of each field. For about two months previous to the appearance of the hemianopsia there had been a constant severe headache in the left parietal and occipital regions, but this pain gradually grew less and finally subsided. Six weeks ago he suddenly lost completely the sense of smell. For the last three weeks he had noticed a failure of vision in the remaining portion of the field of the left eye. Examination showed nothing abnormal in the external appearance of either eye, and the motility of both eyes was unimpaired. R. E. $=\frac{20}{C}$, with sph.—D. 1 \bigcirc cyl.—D. 1.50 axis $180^{\circ}=\frac{20}{L}$. L. E. $=\frac{20}{LXX}$, with cyl.—D. 1.50 axis $180^{\circ}=\frac{20}{XL}$.

The media were clear. Both optic discs were pale, the discoloration being most marked on the temporal side and in the left eye. There was a slight reduction in the caliber of the retinal arteries. The perimeter showed a bilateral right hemianopsia, with some concentric limitation in the remaining half of the field in each eye. At the time I first saw the patient there were no other symptoms than those already mentioned. He had contracted syphilis twelve years before, the chancre being followed by secondary symptoms, but he had been entirely free from constitutional symptoms for more than six years until his headaches appeared, and these were confined to the left side. No explanation could be offered for the recent sudden onset of the anosmia, which lasted till the death of the patient. There was no interference with the sense of hearing, and nothing abnormal in the appearance of the drum-heads. A careful rhinoscopic examination showed nothing but a mild form of chronic naso-pharyngeal catarrh, with some hypertrophy of the adenoid tissue in the naso-pharynx. In spite of

the absence of other symptoms, the hemianopsia and the beginning atrophy of the optic discs pointed to the existence of a lesion in the brain on the left side, and probably somewhere in the vicinity of the cuneus. With the patient's syphilitic history, it was supposable that the intracranial lesion was a gumma, and on that supposition potassium iodide was given for a period of nearly three months, the dose being increased until he took six drachms daily, which he bore very well. But, instead of there being any improvement, there was a progressive loss of vision and a steady increase in the concentric limitation of the field of both eyes. About two months after he came under my observation the headaches returned in the occipital region, and finally became continuous, although they were never very severe. The potassium iodide was then stopped as useless, and the only treatment consisted in relieving the patient's symptoms as they arose. There was never any hemiplegia or hemianæsthesia and no symptoms of motor disturbance till two weeks before his death, when he began to have muscular twitchings of the face and hands, which never amounted to an actual convulsion. He gradually became stupid, lost his memory, sank into coma, from which he at first could be aroused but which soon became profound, and in this condition he died, not quite fourteen months after the first occurrence of his headaches.

The autopsy proved the diagnosis of an intracranial tumor and its location to have been correct, but the microscopic examination showed that it was not a gumma. The tumor, the size of a large walnut, or rather olive, was found in the cuneus on the left side. It lay close to the median line and near the base of the left occipital lobe, its long diameter pointing to the left side. It was of firm consistence, perfectly smooth, apparently inclosed in a capsule, and the surrounding brain tissue seemed to the naked eye normal. There was no other lesion found in the brain. Careful examination was made of the vicinity of the olfactory nerves, but there was no sign of any inflammatory or softening process. The olfactory lobes were atrophied and the olfactory nerves reduced to mere threads.

Not a trace of meningeal or periosteal inflammation could be found anywhere within the skull. An examination of the tumor showed it to be a typical example of the small-cell sarcoma, with marked development of connective-tissue trabeculæ. In this patient the pulse, respiration and temperature were closely watched, but there was nothing abnormal observed till toward the end, when there was a slight evening rise in the temperature.

CASE IV.—THROMBOSIS IN THE MIDDLE CEREBRAL ARTERY; RECENT CLOT IN THE MIDDLE CEREBRAL LOBE; SARCOMA OF THE RIGHT OPTIC TRACT; BILATERAL LEFT HEMIANOPSIA.—Early in October, 1889, an old lady, aged seventy-two years, was brought to me by her son, who gave the following history: About six months before, having gone to bed one night as well as usual, she was awakened early next morning by a severe pain in her head, a sense of confusion, and apparently total blindness in the left eye. She had previously been in fair health, but close questioning brought out the fact that she had suffered from headaches at intervals for more than a year, which she had attributed to some abnormal condition of her stomach. She was confined to her bed several weeks, complaining all the time of the blindness, confusion of ideas, and a numbness of her right arm and leg. She slowly recovered from most of these symptoms, but ever since she has been blind on the left side in both eyes.

An examination showed the following condition: Slight ptosis of both upper lids, but no diplopia. Speech still thick and slow, as if she were searching for a word. The tongue pointed to the left side. Partial right facial paralysis. R. E. = 20°_{XXX} . L. E. = 20°_{XI} , unimproved. Irides and pupils normal. Slight peripheral and nuclear opacities in both lenses. Some small floating opacities in the vitreous of both eyes. Ophthalmoscopic examination negative. The perimeter showed typical bilateral left hemianopsia, and in addition concentric limitation of the halves of the visual fields still remaining. There was organic valvular disease of the heart,

with aortic obstructive murmur and hypertrophy of the organ. Several exhaustive analyses of the urine gave negative results.

In going carefully over the history of the case, I thought the patient had probably had a thrombosis and subsequent rupture of the middle cerebral artery on the left side; and, from the condition of the heart and blood-vessels, I gave an unfavorable prognosis and an opinion that she would probably die in another similar attack at no distant day. She lived, however, for nearly twenty months, during which period the fields remained practically the same. The vision, however, slowly failed, which may have been partially due to the growth of the cataracts. The bilateral left hemianopsia, however, together with the headaches existing for nearly a year before the sudden attack of thrombosis, aroused a suspicion that there might be an intracranial tumor, and she was carefully watched until the end came, without discovering any additional symptom. There had never been any loss of motion in the extremities, and the ill-defined right hemi-anæsthesia entirely disappeared. She was found one morning unconscious and breathing stertorously, and remained comatose until the end, three days later, April 29, 1891.

The autopsy revealed a very interesting condition of things in the brain. In the left anterior lobe of the cerebrum was a patch of softening as large as a horse-chestnut, and in a branch of the middle cerebral artery running through it there was an old plug which obliterated its lumen entirely. There was a recent rupture of a large branch of the middle cerebral artery on the left side, and a large clot of blood in the middle lobe of the brain, close to the fissure of Sylvius. All the arteries of the brain were diseased, and some of them extensively so. At the base of the brain on the right side, overlying the right optic tract and pressing upon it, was a small tumor about the size of a hazel-nut, situated just in front of the corpus geniculatum laterale but not pressing upon it. The tumor seemed to be developed in the right optic tract, which it partially surrounded and compressed. It was of firm consistence and

smooth surface, and proved on examination to be a small-cell sarcoma, originating in the optic tract itself. Here was the probable cause of the hemianopsia and of the headaches which preceded the attack of cerebral thrombosis by nearly a year. It seems strange that there was no ophthalmoscopic sign of cerebral disease such as neuro-retinitis or papillitis when I first examined the patient, but these may have appeared later, when the advancing opacity of the lenses prevented further ophthalmoscopic investigations.

CASE V. GLIO-SARCOMA OF THE CEREBELLUM.—A gentleman, aged thirty-five, called on me in February, 1890, and gave the following history: He had been perfectly well up to about three years before, when he began to suffer from frontal headaches. He had been an overworked man for many years, confined for long hours to office work, and devoting the evenings and late into the night to professional studies. His general health had always been exceptionally good, but the years of overwork and great strain had told upon his strength, and the headaches gradually increased in frequency and severity. At first confined to the frontal region, they subsequently extended all over the head. They were in the beginning intermittent, and were occasionally accompanied by nausea and vertigo. For the past three months they had been constant and at times very severe, but the nausea had disappeared. Four years ago he had received a severe blow on the left side of the head from a falling wooden shutter, which knocked him down but did not cause unconsciousness. There was bleeding from the left ear at the time, which, however, soon stopped, and was not followed by any purulent discharge. Tinnitus began in this ear at once, and the hearing was impaired and steadily grew worse. About three months before I saw him tinnitus began in the right ear and has continued ever since, but the hearing of this ear is not impaired. His condition did not vary much, with the exception that the headaches increased in frequency and severity, until about nine months before I saw him, when he suddenly began to see double. This diplo-

pia was at first accompanied by transient attacks of blurred vision, which later became permanent and progressive. By the advice of friends he consulted an oculist, who told him he was astigmatic and had extreme hyperphoria and esophoria, and that he must have the muscles of his eyes divided and wear glasses. He became a victim of the partial-tenotomy craze to the extent of five operations, without receiving any benefit. The diplopia increased his vertigo and general unsteadiness of gait, so that he was afraid to go alone in the street, especially at night. About six weeks before I saw him he first noticed a loss of sensation on the left side of his mouth, pharynx, tongue and lips, and this still remained. When he presented himself to me he had an anxious, worried expression, and a visible convergence of both eyes, from paresis of both external recti muscles. The paralysis was not complete, as both eyes could be moved outward toward the external canthi. R. E. $\frac{20}{C}$. L. E. $\frac{20}{L}$, unimproved. Irides normal in reaction and pupils of natural size. Media clear. The fundus of each eye showed marked papillitis, with numerous hæmorrhages, all the symptoms being more marked in the right eye. Homonymous diplopia for all distances. The perimeter showed an irregular central scotoma for color, but not for form. The patellar tendon reflex was normal, and the dynamometer showed no difference between the two sides of the body, and no apparent loss of power. The patient had never had syphilis. Repeated examinations of the urine showed albumen, but no casts. When he walked his vertigo was at times so marked that he staggered and apparently rotated toward the right side, and this was not materially lessened by closing one eye. At other times he apparently had no vertigo, and he walked perfectly straight when one eye was excluded.

A diagnosis was made of intracranial tumor, probably located in the occipital lobe or in the cerebellum. The patient was under observation at brief intervals from February, 1890, till his death in April, 1891. His vision slowly grew worse, until he could only recognize the movements of the hand.

There was no very marked change in the fundus, the papillitis remaining at about the same stage throughout, with the occurrence of fresh hæmorrhages at intervals. The headaches became frightful in their intensity, and could only be controlled by large doses of morphine. Toward the end he was at times wildly delirious, and about a week before his death he sank into a stupor which rapidly deepened into profound coma from which he never rallied.

The autopsy showed that the diagnosis and location of the tumor had been correctly made. A tumor, nearly globular in form, measuring about an inch in its longest diameter, was found in the right lobe of the cerebellum, close to the peduncle. It was of rather soft consistence, and proved to be a gliosarcoma. It had compressed the convolutions of the cerebellum mainly upward and outward.

The chief interest in this case lies in endeavoring to trace the cause of the development of the tumor. A patient, the slave of excessive mental work for years, receives a sudden violent blow on the left side of the head, which causes bleeding from the left ear, tinnitus, and impaired hearing. Subsequently he begins to suffer from headaches, at first frontal but subsequently becoming general, and increasing in frequency and severity, until they become constant and are accompanied by nausea. Then follow vertigo on walking, tinnitus in the opposite ear, and a sudden attack of homonymous diplopia, which is found to be due to paresis of both external recti muscles. Immediately succeeding the diplopia comes defective vision in both eyes, which is found to be due to papillitis with hæmorrhages. The vertigo increases, the patient apparently rotates toward the right side in walking, and the loss of vision and headaches become worse, till delirium sets in, ending in coma and death. The weak point in the relation of cause and effect, between the blow on the side of the head and the development of the cerebellar tumor, is that the traumatism occurred on the left side over the parietal and frontal bones, while the tumor was found on the right side.

TOXICOLOGY OF THE MALE FERN, WITH SPECIAL REFERENCE TO VISUAL DISTURBANCE.

BY DRS. K. KATAYAMA AND OKAMOTO.

We know the poisonous nature of the extract of male fern not from the cases of accidental poisoning alone; Puirll (*Diss. Berlin*, 1888), Paulson (*Archiv fr. experimentelle Pathologie u. Pharmacologic*, Bd. xxix, Heft 1 m. 2. S. 1) and Inoko (*Tokyo Iji Shinshi*, No. 689, 1891) have tried experiments on animals, and found that the drug causes irritation of the stomach and intestine, and that it also paralyzes the nerve centers.

We, too, have tried experiments on six dogs and four rabbits, and obtained almost similar results. As our object, however, is not to know the general toxic properties of the drug, but to ascertain its effect on the sense of vision, we shall here touch only briefly on the general symptoms of the poisoning in describing our experiments, and dwell principally on symptoms relating to the eye.

EXPERIMENTS ON ANIMALS.—The æthereal extract of male fern has a peculiar odor, and is not at all palatable; hence, dogs do not like it, and it is no easy matter to make them take it. In our experiments we made it into pills, tucked the pills into meat, and with all manner of persuasion and enticement, could barely succeed in administering the drug. It was a thing infeasible, as we have tried it, to have the dogs take each day a fixed quantity as we listed. It may be supposed that in the form of emulsion a fixed quantity of the drug can be introduced into the stomach by means of a tube. We have tried it, and found it impracticable to repeat the process several times upon the same dog.

DOG A. Age unknown. Body weight 13480 grains. Gave five decigrams to three grams (0.5-3.0) of the extract per day, kept on for seventy-three days, amounting in all to 47.2 grams. When about five decigrams (0.5) were being given, no effect on the dog could be noticed; but upon administering a dose much larger, vomiting and diarrhœa and exhaustion presented themselves. No injury came to the eye. After an interruption of ten days the experiment was resumed, and for sixty days two to eight decigrams (0.2-0.8) were given daily, coming up to 16.0 grams in the aggregate. For all this no derangement of stomach and intestine, nor an^a affection of the eye took place, nor any other disorder.

DOG B. Middle aged. Body weight, 4640 grams. Gave fifteen centigrams to seven decigrams (0.15-0.7) of the extract *per diem*. On the ninth day, when the total quantity exhibited reached up to 2.6 grams, tremor of the whole body appeared which lasted two or three days. During this period and before and after it no detriment overcome the eye. Hence forward in thirty days the sum of 7.75 grams was tried anew, and with intermissions the experiment was continued longer. But nothing came of it, except the refusal of food when a dose of the extract was large.

DOG C. A puppy, two months old. Body weight, 3640 grams. Gave on the first day four decigrams (0.4), and on the third seven decigrams (0.7), making in all 1.1 grams of the extract. On the fourth day already there appeared the signs of poisoning,—universal tremor, notable flexion of the spine, slow response to stimulation, and the curious trick of stretching the hind legs behind in the act of walking. To add to these, thirst was manifest. On the sixth day, the pupils were widely dilated, and they did not react; the axis of vision was turned upward; and the lids were widely open. In walking and running the creature bumped, from time to time, against the walls and chairs near by, and fell from the stairs. Although the threatening attitude of dealing a blow was assumed right in front of its eyes, the dog did not even as much as blink. And again, although a piece of meat was placed be-

fore him, the dog seemed not at all to know it. Only upon bringing it close to his nose did the dog seem to be, for the first time, aware of it—through the sense of smell. All this pointed to his being blind. Therefore, the further use of the extract was stopped.

A day or two after this, great debility followed, and the creature could well-nigh not drag himself. The condition of the eye staid pretty much the same. As the lids had remained open, slight conjunctivitis was set up, owing to the irritating action of the dust.

A week or so after the blindness had taken place, the pupils became somewhat contracted, vision returned a little, and the dog came to be able to get about. In another week he recovered his visual power to such an extent that he could spy out a piece of meat given to another dog and make for it. He continued to grow better, when one day he stole and ate a large quantity of meat preserved in alcohol that had been used in some other experiment. In consequence he suffered for a time from acute alcoholism, but recovered completely in two or three days under proper management. The dog still lives, healthy and strong. His vision is good; the pupils react to light perfectly, but they are somewhat larger than what they used to be before the experiment.

Dog D. A puppy, two months old, (of the same litter with Dog C). For the first three days five decigrams (0.5) of the extract of male fern were given daily. On the fourth day the whole body began to tremble, and action became slow to a degree. The opened eyelids, the dilated pupils and their want of reaction, the direction of visual axis, the loss of vision, etc., were almost same as in Dog C.

Two or three days after the loss of vision, the activity of gait returned somewhat, the pupils contracted a little, but sight improved not a particle. Besides, as the lids had remained open the dust caused irritation and excited slight inflammation of the conjunctiva, with increased secretion.

Nearly a week after the loss of vision, his actions became quite animated, yet the dog was none the less blind.

Some two weeks more, and the eye showed a tendency toward recovery; but like his erring brother, Dog C, this miscreant dog, too, practiced pilfering and had for that an attack of acute alcoholic poisoning. He could not get off so easily as the other dog, and eventually died of it; and we unfortunately could not follow out the entire course of the male fern poisoning.

DOG E. A puppy, about two months old. Body weight, 4120 grams. Having given twenty-five centigrams to five decigrams (0.25-0.5) daily, up to the twenty third day the sum of 5.15 grams had been given, of the extract of male fern. On the day mentioned, both pupils became dilated somewhat, but there seemed to be no interference with vision. In walking the hind legs were a little unsteady.

From now on, continuously and interruptedly 3.875 grams more had been given in thirty days, but nothing followed, the condition of the hind legs remaining the same.

DOG F. A puppy of an unknown age. Body weight, 1400 grams. Gave in eighteen days 3.875 grams of the extract, the daily dose being a hundred and twenty-five milligrams to five decigrams (0.125-0.5). During the last two or three days of the period the whole body, especially the head, shook involuntarily; an appearance of indisposition was visible; the hind legs were bereft of strength; and the act of walking was unsteady. Further, there were vomiting and purging; the strength of vision, too, seemed to have diminished a little, but the reaction of the pupils to light was retained. As it was feared that these symptoms might gradually become worse and the subject fall into collapse, the administration of the drug was discontinued for three days. Then at the rate of twenty-five centigrams to five decigrams (0.25-0.5) a day, 4.375 grams of the extract were given again in fourteen days. When a dose was rather large the dog refused to take food, and had vomiting and purging.

Beside these experiments on dogs, we gave four rabbits 2.0-5.0 grams of the extract in emulsion by means of a stom-

ach tube. The following are the chief symptoms that appeared:

An increased and shallow respiration; a loathing of food (no vomiting by nature); diarrhoea; an appearance of indisposition; inactivity; and but slow response to stimulation. On giving a large quantity, the free motion of the legs was hindered; sometimes the legs presented a spasmodic motion. As to, dilatation of the pupil and any disturbance of vision, although we have repeated the experiment several times, with one, two or five and six days between the aforementioned doses, we were not able to discover them.

From these our own experiments and those of others we conclude as follows:

1. The extract of male fern has a toxic property, and it acts principally on the digestive system and the nerve centers, producing such symptoms as vomiting, diarrhoea, colic, cephalalgia, difficulty of locomotion, dilatation of the pupil, impaired vision, hurried respiration, motor paralysis, depression, etc.

2. The main reason why we see more reports on poisoning by the extract of male fern lately than before, lies in the fact that in recent years the dose of the medicine has been increased considerably. As the quality of the medicine varies according to the degree of freshness of the preparation and the like, the fatal dose cannot well be determined. In general, however, when a large quantity is given there invariably appears an almost constant series of symptoms.

3. It is true that after the use of extract of male fern loss of vision sometimes appears, but it is not constant; only under a certain condition does it make its appearance.

4. Loss of vision is one of the symptoms of poisoning by the extract of male fern, and it is a matter of course that it may appear along with the other symptoms. However, it does not seem to be necessarily contingent upon the size of the dose and the mode of administration.

5. In looking over the various reports, we find that the patients who had failure of vision consequent to the use of the extract of male fern were generally persons of poor health.

The two dogs that became blind in our experiments were also young and weak. In general, amblyopia or amaurosis from poisoning (*e. g.*, by alcohol or by tobacco) is common in people of enfeebled constitution. From this we may rightly infer that the liability to amblyopia after the use of the medicine exists mostly in people of poor health. Not that persons of feeble health have all this liability alike, but that some among them must particularly be susceptible to the toxic action of the drug.

6. Such being the facts, therapeutists or practitioners of medicine would perhaps, do well to note the following points:

a. The extract of male fern is better to be prescribed in small doses.

b. The extract of male fern is readily absorbed when given mixed with oil. Even without oil, it is absorbed when it remains long in the alimentary canal.

c. After the extract of male fern, do not give castor oil. See to it that some other cathartic is given.

d. When the extract of male fern is used, always look out for such symptoms as headache, amblyopia, etc.; and as soon as the slightest indications of these appear, stop the further use of the medicine.—*Sci-I-Kwai Medical Journal*.

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

NOVEMBER, 1892.

No. 11.

ORIGINAL ARTICLES.

GLASSES ON A CHILD TWO YEARS OLD FOR CONVERGENT STRABISMUS.

BY S. C. AYRES, M.D., CINCINNATI, OHIO.

The adjustment of glasses to cases of convergent strabismus during the intermittent period and before permanent contraction of the internal rectus has taken place is always desirable. But unfortunately such cases are not always seen in the early stages, and when seen are often too young to wear glasses. The efficacy of this treatment is well established and the final result is much better than the operation of tenotomy which was done so indiscriminately some years ago. Experience has taught surgeons that while the primary result was very satisfactory, yet five or ten years later these same cases were found to have a perceptible and even a marked divergence.

The correction of the ametropia and the constant use of glasses has relieved many of these cases from the necessity of an operation. As strabismus often shows itself in the first or second year the wearing of glasses is sometimes a physical im-

possibility. There is a marked difference in tolerance of children for glasses. Some take to them kindly while others refuse them entirely. Danger to the eyes must be taken into consideration.

A remarkable tolerance for glasses came under my observation last summer and as the patient was only a little more than two years old, I deem it worthy of report. The patient was a bright little girl in whom the parents had noticed occasional squint for two or three months but lately it had become more pronounced.

I told the mother that the only way to give relief would be to order glasses for constant use, but I expressed a fear that they would not be tolerated. She agreed to try them and an estimate of the anomaly was made and then glasses were ordered. Two weeks later I saw the little patient and I was told that not only did she wear the glasses willingly, but that as soon as she awoke in the morning she asked for them. They evidently gave her relief and she was not willing to begin the day without them. There was also a marked improvement in the convergence. From a letter received a few days ago I learn that she still wears them (it is now about five months since they were ordered) and that the eyes are parallel. I have a good many times ordered glasses for similar cases for children three and four years of age but never before for one so young.

SOME REMARKS ON POST-TYPHOID EYE- AFFECTIONS.¹

BY ADOLF ALT, M.D.

Affections of the eye after typhus or typhoid fever are but very rarely observed. This scarcity of this occurrence accounts undoubtedly for the fact, that most text-books not even mention such affections. Furthermore, when seen, they have no peculiarities which could be considered as characteristic of the specific typhoid infection; on the contrary they are affections which may be seen occurring from lack of resistance of the general system after exhausting disease.

At the request of your committee I shall give you in the following a short resume of what I can find on this subject in ophthalmological literature, and add to it a few of my own observations.

The largest amount of information regarding the eye-affections under consideration is to be found in Foerster (Graefe and Saemisch, Vol. VIII, I, p. 167). He enumerates the eye-affections seen after typhoid fever as the following: Abscess and ulcer of the cornea, paresis of the accommodative apparatus, paresis of the sphincter pupillæ, paralysis of external muscles of the eye, transitory amaurosis and atrophy of one or both optic nerves.

Abscess of the cornea has been described by Saemisch, Arlt, Schweigger, Adler and Eetlinger.

¹Read before the St. Louis Medical Society during the discussion of the present typhoid fever epidemic in this city, November 5, 1892.

Henoch saw ptosis and paralysis of the right abducens muscle.

Disturbances of the accommodation and mydriasis have been seen by a number of observers.

Transitory amaurosis, especially after intestinal hæmorrhages, and lasting amaurosis from atrophy of the optic nerve have been more frequently seen, than other affections.

Gowers in his Medical Ophthalmology differentiates between sequelæ following typhus and such which follow typhoid fever. Among the former he mentions loss of sight during convalescence and subsequent atrophy, of one or both optic nerves. He states, however, at the same time that in some of these cases cerebral symptoms, like hemiplegia, accompanied the affections.

After typhoid fever, he again particularly mentions the occurrence of amblyopia and amaurosis. The lasting amaurosis may be due to atrophy of the optic nerve with or without preceding inflammation. In some cases true optic neuritis has been seen during the height of the fever or in the period of reconvalescence. Such observation, however, arouse the grave suspicion, that they were rather cases of meningitis, than of typhoid fever, an error into which more than one diagnostician has fallen.

Galezowski and Snell have seen embolism of the central retinal artery during convalescence from typhoid fever.

Schmidt-Rimpler in his text-book mentions floating opacities in the vitreous humor, the expression of a mild choroiditis or cyclitis, and furthermore symptoms of mild iritis.

It is a strange fact that none of the authors mentions a corneal affection which it has fallen to my lot to see in two instances, namely, keratomalacia, that is total necrosis of the corneal tissue. In both cases the patients were of a very low and uncleanly class who had gone through a severe attack of typhus fever in great poverty and consequently with little or no care. They consulted me during the period of reconvalescence when still very weak and emaciated, and in both of

these cases the whole of one cornea was sloughed away so that the iris lay bare.

I do not consider this dire result, which by proper care could, perhaps, have been prevented any more characteristic of or due to the specific typhoid infection, than the abscesses and ulcers of the cornea seen by other observers. They are undoubtedly due to the almost uninterrupted exposure to atmospheric influences, heat, dust, etc., of a cornea which is sadly deficient in moisture and nutrition, and therefore, belong to the same class of corneal affection which we find resulting from exposure in paralysis of the fifth nerve, paralysis of the orbicularis palpebrarum from facial palsy, in Basedow's disease, etc.

In a number of cases of anæmia of the optic nerve and retina, and of beginning atrophy of the optic nerves, which came under my care, the patients stated that they had first become conscious of a visual deficiency when recovering from typhoid fever. I looked upon these cases as not being due to the specific typhoid virus. They all recovered under tonic treatment, more particularly by subcutaneous injections of strychnine.

Only in one instance, that of a lady in the climacteric period, who came to me when convalescent from typhoid fever, did I find a number of peripherically situated patches of plastic choroiditis and opacities of the vitreous. Such an affection is, however, comparatively frequent in females of that age who have not suffered from typhoid fever and is, therefore, not any more characteristic of this disease, than any of the affection mentioned above.

ADDITIONAL OBSERVATIONS.

Since preparing the foregoing I have seen two cases of post-typhoid affection.

One case was that of a child of four years to whom I was called in the third week of an attack of typhus fever. I found

an abscess of the right cornea involving more than one-third of this membrane.

The other case is of more interest and concerns an affection, not mentioned, so far as I know, in literature.

Mrs. L., soon after having been delivered of a child, fell victim to a very severe attack of typhus abdominalis complicated with myositis. In the second week redness and swelling of the right eye was noticed and treated as conjunctivitis. When the eye protruded between the lids and sight was abolished I was called in consultation. I found an orbital cellulitis which slightly pointed above the external rectus. There was at the same time total synechia of the iris and $V=0$. A deep incision freed about two drachms of pus and the swelling and pain of the right eye readily subsided. At present she sees light and there is a chance of making an artificial pupil of some value in the near future.

In the October, 1892 number of the *Archives d'Ophthalmologie*, Gillet de Grandmont reports a case in which typhoid fever was followed by iritis with hypopyon. He obtained in this case pure cultures of the bacillus of typhoid fever from the pus in the anterior chamber. If this experiment could be successfully repeated, my opinion, that the eye affections after typhoid fever are not due to the specific virus of this disease would be proven fallacious.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

FRIDAY, JULY, 8, 1892.

HENRY POWERS, F.R.C.S., President in the Chair.

IMPLANTATION CYST IN THE ANTERIOR CHAMBER AFTER CATARACT EXTRACTION.

Messrs. Richardson Cross and Treacher Collins reported two cases. The first was that of a woman, æt. 64, who had had an uncomplicated extraction of cataract with iridectomy performed on her left eye, and who subsequently could see to read and sew. Seven months after the operation an attack of acute glaucoma came on, and the sight rapidly failed. The eye was excised a year later. Examination of the eyeball, after excision, showed that in the anterior chamber there was a large cyst, lined throughout by laminated epithelium. It was bounded in front by the posterior surface of the cornea, below by the anterior surface of the iris, which curved round it, and behind partly by the lens capsule and partly by the hyaloid of the vitreous. The iris, where it ceased to be in contact with the cyst, was in apposition with the cornea. The angle of the anterior chamber was closed in its entire circumference, a portion of the root of the iris having been left above in the situation of the coloboma. The optic disc was cupped.

The second case was that of a man, æt. 41, who had a cata-

ract extracted from his left eye, with iridectomy. At the conclusion of the operation the anterior chamber was washed out with a solution of the biniodide of mercury 1 in 25,000. Striated keratitis came on subsequently and persisted. Seven months later a thick opaque membrane filling the coloboma was needled; after this the eye remained painful and blood-shot, the cornea became more hazy, and new blood-vessels developed in it. The eyeball was ultimately excised two years after the extraction. At the pathological examination a cyst was found in the anterior chamber lined by laminated epithelium closely resembling that on the surface of the cornea, the most flattened cells being toward the interior of the cyst.

The cyst was somewhat triangular, one side being in contact with the cornea, another with the iris, and a third with the lens capsule and vitreous.

For the determination of the mode of formation of these cysts, the writers considered it was necessary to ascertain the origin of the laminated epithelium found lining them. Two possible sources suggested themselves:

1. That it was derived from proliferation of the endothelium lining Descemet's membrane, and the anterior surface of the iris.
2. That some of the surface epithelium was carried in at the time of the operation, and had subsequently proliferated.

The latter view seemed the more probable because the epithelium was found on the surface of the lens capsule and the hyaloid of the vitreous, and was not confined to the iris and Descemet's membrane, and because epithelium-lined cysts had been produced experimentally in rabbit's eyes by such implantations of surface epithelium. The first case was of additional interest from the fact that the eye became glaucomatous. The cyst, which filled the whole of the coloboma, must have prevented fluids passing through it into the anterior chamber. Consequently the iris became pressed forward into contact with the cornea, and folded round the cyst, very much as it is round a lens when dislocated into the anterior chamber

and blocking the pupil. In this way the whole of the cornea became closed by the periphery of the iris, and the exit of intraocular fluids arrested. The paper was illustrated by lantern slides.

The President thought it remarkable that cysts from implantation of surface epithelium were not more common after extraction of cataract.

Mr. Hulke said that cysts of the iris had in his experience followed accidental perforating wounds of the eyeball. Their occurrence after operative incisions was comparatively new to him, but he thought that the explanation given by the authors of the paper was probably correct for both classes of cases.

ACCIDENTAL VACCINIA OF THE EYELIDS.

Mr. Tatham Thompson (Cardiff) communicated notes of the case of a man, *æ*t. 38, whose left eyelids had become accidentally inoculated. The lids were *œ*dematous and painful, and at the outer canthus the edges were involved in a purulent ulcer with indurated margins. There was great tenderness of the affected parts and painful enlargement of the glands at the angle of the jaw and down the sterno-mastoid. The man's child had been vaccinated a short time previously, and his wife had been accidentally inoculated therefrom. The man had suffered from slight marginal blepharitis, with excoriation at the outer canthus, and the inoculation had probably occurred at that point.

A CASE OF SYMMETRICAL DACRYO-ADENITIS.

This case was reported by Mr. Simeon Snell (Sheffield). The patient was a married woman, *æ*t. 36, who came under observation March 22. Ten weeks previously the right eye became inflamed; this was soon followed by a swelling beneath the upper lid, which gradually increased and was accompanied by pain. A similar condition on the left side had begun a week before she came to the hospital. Both lacry-

mal glands were enlarged, hard, and tender to the touch, the right being much more affected than the left. The history threw no light upon the cause of the disease. In spite of the absence of evidence of syphilis, iodide of potassium (five grains) was given three times a day, and was rapidly followed by subsidence of the swelling and other signs. During the time the lacrymal glands were decidedly enlarged, there was an almost complete absence of tears on the right side, and a noticeable diminution in their secretion on the left side.

LIVING AND CARD SPECIMENS.

Mr. Lindsay Johnson: A Modification of Priestley Smith's Perimeter, with Adaptation of Electric Light.

Mr. S. A. Stephenson: A Meridian Delineator.

Mr. Juler: A Case of Optic Neuritis with Retinal Changes.

Mr. Sheppard: A Strabismus Hook with Cutting Edge.

Mr. Tatham Thompsoe: (1) Episcleral Gumma; (2) Rupture of Choroid in Macular Region; (3) Rodent Ulcer of Face, with Hypertrophy of Eyelid; (4) Recurrent Sarcoma in Parotid Region.

Mr. Brailey: Ectropion Following Burn Treated by Transplantation of Skin from the Arm.

Dr. D. J. Wood: Partial Detachment of Retina with Unusual Dilation of Retinal Veins.

ELECTION OF OFFICERS.

The annual meeting of the Society was held after the ordinary meeting and the following officers elected for the ensuing year:

President—Henry Power.

Vice Presidents—James Bankart, Exeter; John Hughlings Jackson, M.D., LL.D., F.R.S.; George Lawson; William M. Ord, M.D.; D. C. Lloyd Owen, Birmingham; Simeon Snell, Sheffield; John Tweedy.

Treasurer—George Cowell.

Secretaries—Charles E. Beevor, M.D.; Gustavus Hartridge.
Librarian—W. Adams Frost.

Other Members of Council—James Anderson, M.D.; F. Richardson Cross, Bristol; James McKenzie Davidson, M.B., Aberdeen; Robert W. Doyne, Oxford; Henry Eales, Birmingham; J. R. Lunn; J. A. Ormerod, M.D.; Herbert William Page; D. D. Redmond, Dublin; W. C. Rockliffe, M.D., Hull; G. H. Savage, M.D.; A. Quarry Silcock.

SELECTIONS.

INFANTILE CATARACT.

BY ALBERT R. BAKER, M. D., OF CLEVELAND, O.

I selected this subject, not because I had any new facts to communicate, or new operations to propose, or new theories to advance; but because my experience, observation and reading has lead me to believe that, as a rule, we do not treat infantile cataract as successfully and as intelligently as we do many other eye diseases. If I am correct in this supposition, an interchange of ideas on this important subject at this time cannot fail to be of value.

I know of no subject more perplexing to the medical student than the classification of cataracts; they have been classified as to age as congenital, infantile, juvenile and senile, as to consistency as fluid, soft, mixed and hard. They may be capsular or lenticular. Capsular cataracts may be pyramidal, anterior polar, posterior polar, or degenerative. Lenticular cataracts may be nuclear, cortical or zonular. Cataracts have been classified as to cause, as albuminuric, diabetic, traumatic, etc. They may be simple or complicated, primary or secondary, ripe or unripe, mature, immature or hypermature. This list might be continued almost indefinitely, but is sufficient to illustrate the protean forms in which lenticular opacity presents itself to the ophthalmic surgeon, and it is in the child that we find the most remarkable variation, in the cases brought to our notice. It was that prince of ophthalmologists, Mr. George Critchett, in a letter published in the *London Lancet* as long ago as 1855, who said that "Congenital catar-

act deserves very careful notice on account of the numerous aspects it assumes, the frequency with which it is overlooked, the baneful influence it may exert upon the prospects and career of the patients, and the favorable results of suitable treatment. The more we have an opportunity of observing these cases, the more evident does it become that nature revels in variety. Even in her morbid operations, when we fancy that we have exhausted every possible form, some new manifestation presents itself."

For our present purpose it is not necessary to enter into an extended discussion of that much debated question, whether cataract is ever congenital, as it makes little practical difference (although the question may have an etiological value), whether it is present at birth or comes a few hours or days afterward. Dr. Alt¹ saw a case of total lenticular cataract in a baby 24 hours old. The writer saw a milky white lenticular cataract of one eye, other eye normal, in a child 24 days old. The mother and an intelligent nurse said the opacity was present at birth. Granting that cataracts may be congenital, it seems to me more desirable to substitute the term "infantile cataract," so as to include all those occurring in infants and young children. Practically many of these cases do not come under the observation of the oculist until later in life, often being overlooked until 5, 10, and even 15 or 20 years of age.

The most frequent form of infantile cataract is the lamellar or zonular. These cases are not infrequently associated with other congenital defects, the intellectual faculties often being very imperfect. Mr. N. C. McNamara,² in his Presidential address to the Ophthalmological Section of the British Medical Association, remarked, in opening the discussion of this subject, that "it was well known that in foetal life branches of the hyaloid artery covered the posterior surface of the lens, and advanced forward over its margins, helping to form the membrana capsulo-pupillaris. If, from fault in the development

¹AMERICAN JOURNAL OF OPHTHALMOLOGY, December, 1887.

²British Medical Journal, September 12, 1891.

of the eye, this vascular layer persisted after birth, it was apt to give rise to a film of connective tissue, extending to a greater or less extent over the posterior surface of the lens, and so forming a zonular cataract. In some instances a small patch alone was left to mark the spot at which the hyaloid artery had passed on to the lens, in other cases a central opacity existed, with radiating bands stretching toward the periphery of the lens. Microscopical specimens have demonstrated the fact that some of these zonular cataracts consisted of a film of connective tissue, together with remains of the hyaloid artery." This seems to be the most satisfactory explanation yet offered of the pathology of zonular cataracts, and it seems much more rational to attribute the convulsions which have figured so largely in the literature of this subject to the same cause which brought about the development of the lens, the defective mental faculties, and the other bodily defects so frequently seen in these cases. An attempt was made to secure statistics bearing upon the relative frequency of cataracts associated with hare-lip, cleft palate, coloboma of the iris, total absence of iris, spina bifida, etc.; but I could find nothing satisfactory. I regret exceedingly that I have not kept more accurate records of these cases occurring in my own practice, and yet the experience of any one man, unless he had exceptional advantages for observation, would not include enough of these cases to be of much practical value. Upon referring to my case books I find records of only two cases of congenital total absence of the iris, and in both of which cataracts were present. One of these had interstitial keratitis and typical Hutchinson teeth. The other was confined to a penal institution and a confirmed criminal. One lens was partially dislocated, and by throwing his head backward in a peculiar jerky manner he could throw his lens partially back like a door, out of the visual axis, and thus secure a fair amount of useful vision. He said his father's eye had just the same appearance. Of nine cases of coloboma of the iris two had cataract. I have met with two cases of cataract associated with hare-lip,

and one with spina bifida, and a number of cases had Hutchinson teeth.

If time permitted, it would be interesting to consider hereditary influence in the production of zonular cataract. A few years since I was called to operate upon three brothers, aged respectively 11, 21 and 29 years. There was one other son and three daughters in the family whose eyes are normal. The parents were cousins and one grandparent had senile cataract otherwise the family history is good.

Next frequent to the zonular in infants is the anterior polar or pyramidal cataract. Notwithstanding the great diversity of opinion as to the etiology of these capsular cataracts, I have no doubt but that they are nearly all due to a perforation, or at least inflammation, of the cornea. It is not necessary that any corneal opacity should be present. About two years ago a child was presented at my clinic, 2 months old, with a history of having had a very severe attack of ophthalmia neonatorum, with perforation of both corneæ. There was a dense white corneal opacity, including nearly the whole cornea, so that it was impossible to see the pupil of either eye. In the course of a few months the corneal opacities cleared up so that typical anterior polar cataracts could be seen, which were removed by the suction operation. At present there is no corneal opacity, and it would be impossible from any examination to say that there had been a perforation. It is surprising that so accurate an observer as Dr. Alt³ should not have seen such cases.

Not infrequently the lens undergoes degenerative changes, its fluid constituents become absorbed, leaving behind a tough dense membrane often containing more or less calcareous substance. I have met this condition most frequently in traumatic cases, or in cases which have been operated upon repeatedly by the needle operation. I have come to look upon the usual needle operation as a frequent cause of this condition. How often after needling an infantile cataract several times, have you found the pupil still occluded with the dense white remains of the capsule and shrunken, possibly calcareous lens,

through which you have been able with great difficulty to tear a hole—a poor excuse for a pupil, but you congratulate yourself upon securing even that? This has been my unfortunate experience so frequently that I have almost abandoned the needle operation in cases of zonular as well as pyramidal cataracts. After trying several operations my preference is for the linear extraction combined with the suction operation with Mr. Teale's instrument, in which the suction is made by the mouth of the operator. I have never been able to get a Bowman syringe that I could use so well.

The anterior capsule should be divided in both the vertical and horizontal meridians to the full extent of the dilated pupil, and the lens pretty thoroughly broken up, but avoid perforating the posterior capsule. Keep the pupil well dilated, and in from three to five or six days, possibly seven, make a broad incision at the outer part of the cornea about two or three lines from the sclero-corneal margin, with the keratome. In many cases by partially withdrawing the instrument and pressing it backward, and as the aqueous escapes, the softened lens matter runs out almost of its own accord, the remaining portion, if any, can often be coaxed out with a little stroking of the opposite side of the cornea with the spatula. If there is a hard nucleus it can be delivered in the usual manner. If the papillary area cannot thus be readily cleaned the suction curette can be inserted, and by sweeping it around carefully the remaining cortical substance can be removed. Care should be taken not to injure the iris. In one instance in which I made the incision near the sclera-corneal margin, I had a slight anterior synechia, and the pupil is slightly oval in shape but otherwise there have been no untoward symptoms. Since this accident occurred I have made the incision in the cornea further forward; and the danger of synechia is lessened, and the lens substance removed more easily; mydriatics can be used much more freely so as to keep the pupil well dilated without danger of prolapse. By this method patients are discharged in from two to three weeks, which under the old method would have occupied months, and often valuable time

in the child's education sacrificed. In very young children on account of the difficulty in managing the patient; it may be preferable to resort to the needle operation. In these cases there is not the same necessity of securing useful vision at once, and yet in cases showing a disposition to develop nystagmus, I very much doubt the propriety of wasting time to allow the lens to absorb when it can be removed so easily. The lens, however, is absorbed much more quickly in those cases than in older children. I have followed the rule applicable to senile cataract, and operated but one eye at a time, and have several times questioned the advisability of making an iridectomy, and of permitting the lens to remain in one eye so as to allow of a certain amount of accommodations for near work.

I have under my care now, a bright little boy 6 years of age, whose vision in the left eye was $\frac{5}{cc}$ increased by dilating the pupil to $\frac{15}{cc}$, in the right eye $\frac{20}{cc}$ with pupil dilated increased to $\frac{20}{1,xx}$. I removed the lens of left eye by the method detailed above, and secured vision $\frac{20}{xx}$ with + 10 D. Before the operation there was considerable nystagmus which has all disappeared. When the pupil of the right eye is dilated with cocaine he can read Jaeger No. 3, and has considerable amplitude of accommodation, especially for larger type.

I should be pleased to know if any of the members of the Section have had any experience in this direction. Would the amount of accommodation in such an eye be of any practical advantage to the patient, and if so, would it be enough to compensate for the deformity of an iridectomy?

Would there be any objection to postponing farther operative interference until later in life, when the patient could express an intelligent opinion on the subject?³

It has been my custom to recommend operation within the first year. I operated upon one case at two months. There are cases which it may be advisable not to operate upon at all.

A doctor friend of mine has a typical anterior polar catar-

³I think Mr. Critchet suggested this procedure many years ago, but I could find no record of cases in which it was practiced.

act of both eyes, so prominent are they, that he always wears colored spectacles when in company, to hide them. He completed a regular collegiate course, graduated in medicine, and is now doing a large general practice.

If operative interference is decided upon, the question is to be answered whether the lens is to be removed or an iridectomy is to be performed.

I have followed the rule laid down by an old instructor, Mr. Streatfield, and removed the lens in all cases in which the vision could not be improved, by suitable correction of refractive errors, with the pupil widely dilated to $\frac{20}{L}$. Practically this rule has left but few cases for iridectomy, and those cases in which I have made this operation have been rather disappointing in results, and in several instances a subsequent removal of the lens became necessary.

In conclusion I will offer the following for your consideration:

1. Infantile cataracts should be operated upon early, within the first year if possible.
2. In pyramidal and zonular cataracts in which vision cannot be improved to $\frac{20}{L}$ after fully dilating the pupil, removal of the lens is to be preferred to iridectomy.
3. Fluid cataracts are best removed at once by linear extraction.
4. Soft cataracts including zonular and capsular, are best treated by first breaking up the lens thoroughly, and removing a few days later, by the combined linear extraction and suction operation.
5. Simple dicission is sufficient in very young infants, unless nystagmus should be present.
6. Only one eye should be operated upon at a time.
7. There are few cases in which it may be advisable to extract one lens for distant vision and make an iridectomy on the other eye, so that a certain amount of accommodation may be preserved for near work.

DISCUSSION.

Dr. B. Alexander Randall, Philadelphia:—The point was raised in the paper in regard to zonular cataract as examined with the microscope, that a portion of the hyaloid artery of the fœtus had been traced into the cataractous zone. This matter has escaped my observation, and is contrary to anything that I have studied in the matter. I would ask if I heard aright. The hyaloid artery with its capsular and papillary net-work is wholly external to the lens-capsule, and I cannot conceive of its having any connection with the opaque laminae of lens-substance within.

Dr. A. R. Baker, Cleveland, Ohio:—I have presented this paper not so much because I had any new ideas to advance as with the hope of gaining some information upon the points presented. In reply to the question of Dr. Randall, I would say that I am indebted to Macnamara for that point in regard to the remains of the hyaloid artery being present in these cases. He says that microscopically, remains are to be seen in many of these cases.—*Jour. Am. Med. Assoc.*

A CASE OF ACQUIRED ANTERIOR POLAR CATARACT.—REMARKS
TO DR. BAKER'S PAPPER, BY ADOLF ALT, M.D.

Referring to a remark in the paper of Dr. Baker concerning my not having observed cases of acquired anterior polar cataract, I wish to state, that within a few weeks I have seen such a case.

J. W., æt. 13, came to consult me about a purulent otitis media in both eyes and stated that I had treated him nine years previously for an eye trouble. My case-book being referred to, I found, that when four years old he was brought to me a pitiful sight of inherited syphilis with parenchymatous

keratitis in both eyes. In the left cornea an abscess developed and perforated while he was under treatment and he slowly recovered. He has now a nubecula of the right cornea and a leucoma of the left one. In both ears, however, there is a good-sized anterior polar cataract. In the left eye the perforation of the cornea may be blamed for this,—but what is to be blamed for the occurrence of the cataract in the right eye, where no perforation of the cornea took place?

Evidently the development of the anterior polar cataract in the right eye is not due to any mechanical cause, as may be the case in the left eye. I suppose then that we have here to deal solely with an intra-capsula inflammatory process due to the general disease.

A CASE TOXIC, CENTRAL AMBLYOPIA TERMINATING IN PROGRESSIVE ATROPHY; WITH GENERAL CONSIDERATIONS.¹

BY ALFRED HINDE, M. D., CHICAGO, ILL.

J. L. G——, aged thirty-eight, Canadian cooper by trade, married, free from venereal infection, has been a beer-drinker to excess for about six years, and would smoke daily from one to two ounces of fine-cut tobacco. During the past two years he has been a great sufferer from dragging pains in different parts of the body. They were "very distressing" in the lower extremities, especially on deep pressure over the posterior surfaces, so that during nine weeks, one year ago, he could not sit down on a chair, and, in order to sleep, he had to rest in the prone position of the body. He had also severe head-pains of the same sudden, pulling, steady character. These pains were worse at night, and markedly intensified after each drinking-bout.

During the periods of most intense pain, for two years past, he has been in the habit of relieving, temporarily, his suffering by the internal and local use of alcohol and water. The pains are least severe in warm weather, and during summer time he needed less alcohol than in the winter months.

There is present a marked tenderness on deep pressure over the large nerve-trunks—sciatic and musculo-spiral. He lacks general nervous tone, and his weight five years ago was one hundred and eighty pounds, but now it is about thirty pounds less. He considers that he has been sexually intemperate during the last five years.

¹Patient shown and paper read before the Rush Medical College Class, at the Neurological Clinic, February 25, 1892.

About six months since he first noticed that his vision became slightly foggy, and from then until the present this foggi-ness has become more and more intense, so that now he can see objects somewhat better when not looking directly toward them, or "out of the side of my eye!" With the right eye alone he reads $\frac{12}{60}$, and with left only $\frac{19}{60}$, and glasses do not improve vision. With both eyes he reads only No. X. Snellen at five to seventeen inches. All objects are befogged and must be seen at a nearer point, or at a greater angle—hence of larger size—than is required by eyes having normal vision. The external ocular muscles are healthy, and the intra-ocular muscular apparatus is normal so far as the above range of accommodation is concerned. The pupillary reflexes, direct and consentaneous, are quite torpid, whereas the accommodative² reflex is present and much more acute than the others. The pupils are of medium size.

The eyeballs have a healthy appearance and the media are clear. The outer halves of the optic papillæ are much paler than the inner, and whiter than normal, and their surfaces are somewhat depressed. The arteries of the retina appear of normal size and color.

The visual fields are found to contain a central area in which objective vision is markedly impaired but not lost. This scotoma is symmetrically situated in each field, is of oval form, involves the macula, and extends horizontally to the blind spot of the optic nerve entrance. Outside of this central amblyopic region the visual field is more nearly normal, until

²The impairment of the direct and consentaneous reflexes is most probably due to the anæsthetic condition of the *afferent* optic nerve-portion of the iritic reflex arc, the nuclei of the third nerves, and their trunks, the *efferent* part of the arc, remaining normal. The presence of the accommodative reflex, an associated movement, is most readily accounted for by the fact that the requisite nerve-stimulus for convergence of the eyeballs through the volitional internal recti muscles necessitates a simultaneous explosion from the nuclei of the avolitional sphincter irides and ciliary muscles, because of the interconnection of the three nuclei in the floor of the third ventricle and the aqueduct of Sylvius. These nuclei constitute almost an independent center with its separate blood-supply, and, together with their branches, as above given, are the active mechanism in the production of the Argyll-Robertson pupil wherever found.

we reach its periphery. The right field is peripherically contracted at its upper and nasal limit. The left field is contracted somewhat at its nasal boundary. His color perception is generally impaired—most for green (appears dark to black), next for red, then yellow, and least for blue—though he makes mistakes in the grouping of shades of all the above colors.

He has noticed that his vision is worse when the eyes are exposed to a bright light, as on sunny days and at mid-day, more than in the morning and evening, or on cloudy days. He sees very slightly better, on testing, with his back to the light, than when the luminous rays strike the eyeballs.

In ascertaining the history of this patient he first said that he was no whiskey-drinker, and yet, with the peripheral pains, the nerve-trunk tenderness, and the marginal limitation of the visual fields, it was difficult to explain the facts by means of nicotine poisoning alone, and beer had an insufficient amount of alcohol to produce them. Only on further questioning did he admit the ingestion of diluted alcohol as an anodyne.

From the foregoing we are led to a diagnosis of central amblyopia dependent upon a toxæmia due to tobacco and alcohol. The case is a severe or advanced one of tobacco-amblyopia with the added factor of a progressive atrophy, as shown by the extensive involvement of the color sense, and the commencing limitation of the visual field, together with a peripheral alcoholic neuritis, that preceded the eye symptoms, and continued with them.

The amblyopia due to the tobacco is not as much dependent upon the amount of the weed used as upon individual idiosyncrasy. The fine-cut, or shag tobacco of the stronger varieties is the most likely to produce the eye-symptoms. Heredity would seem to play a part, for male smokers in a family have been known to be affected, and in these same families some of the women at the climacteric period have been known to develop optic nerve atrophy. Locality and nationality may affect results, for Hutchinson observed that strong tobacco was the controlling drug in these cases in England, whereas in Ger-

many, Uththoff³ found that alcohol played a greater etiological part in the production of "amblyopia."

As might be surmised, the male sex is almost alone in this disease, 4 only were women, and he noticed that persons who learned to smoke with difficulty and those who were especially prone to sea-sickness were frequent cases in his group of central amblyopes supposed to be suffering from tobacco-poisoning.

The affected are usually beyond thirty years of age, and rarely have cases been reported in total abstainers⁴ from alcohol, and youths have been known to be the subjects of the disease. Again, save in very advanced cases, the evidence in favor of tobacco, as against alcohol, in the causation of the disease, is supported by the fact of the gradual and often complete recovery of such cases on the withdrawal of tobacco, without other treatment.

It is, however, rare to find cases of central amblyopia in smokers who are water-drinkers. The large majority are persons who have used tobacco and alcohol to excess and who have lived an otherwise depraved life. Yet, the numerous alcohol neurotics of this clinic are generally free from dependent eye-symptoms. After years of observation in these cases, and in a few cases of women drinkers, who are not smokers, yet sufferers from general neuritis, I have yet to see the first case of typical central amblyopia.

This would indicate that the connective-tissue inflammation of the optic nerves is much less frequent than inflammation of the same tissue in the spinal nerve-trunks—which accords with clinical observation.

In chronic alcoholism the cerebral meninges are markedly thickened from connective-tissue proliferation, and the optic nerve-sheaths are but a prolongation of these, with a reduced

³Uththoff (as quoted by Noyes, *Diseases of the Eye*, p. 618) in one thousand cases of alcoholism found six per cent affected with "amblyopia," and about thirty per cent of the one thousand cases had eye symptoms of different kinds.

⁴Among others, Noyes (*Diseases of the Eye*, 1890, p. 619), reports one case in an artist who "never drank wine nor liquor, but smoked constantly."

blood-supply. Because of the greater distance from the central supply of alcohol, and the relatively smaller blood-supply, and, may be, more complete oxidation, of the drug, the less frequent optic neuritis may be partially explained. Yet without the alcoholic soaking of the optic nerve tissues, I believe that tobacco alone would as rarely produce interstitial optic neuritis, as it fails to inflame the other nerves of the body. Nicotine may have predilection for the optic nerves, but these cases are most often due to a mixed poisoning.

Again, did we possess the delicacy of exact limitation in the early stage of the spinal nerve neuritis, and know exactly the location in the nerve-trunks of the first-affected fibres, as we do in the optic, there would be little surprise if we learned that the extension of the inflammation spread from the already inflamed sheath first to the outermost fibres of the bundle, as occurs in these optic nerve inflammations.

This probable course would again show the etiological part played by the alcohol, yet we must confess the immunity shown by the comparative rarity of the optic nerve affection, save where tobacco has also been used. The escape of many chronic alcoholics from general neuritis only demonstrates the invulnerability of many persons against the toxic effects of alcohol, a parallel to the chronic smokers who escape a central amblyopia. If the early progress of the two forms of neuritis—special sense and ordinary sensory nerve—should be the same, we can the more easily understand the equally favorable early prognosis in both varieties. Both are peripheral neuritides, and the fact that the optic nerve cannot express a pain, but can only flash a light, is the reason for the principal difference in the treatment of the two forms—one cries for an anodyne, the other does not.

Not considering violet, the color having the smallest area of recognition in the normal retina is that of green; then red, yellow, and blue, in order, have larger fields. The impairment of color-preception, in pathological conditions, is first noticeable for green. If the disease progressively occupies a still

larger extent of the nerve or retina, the next color imperfectly recognized would be red, then yellow, and lastly blue.

This general diminution of color-preception, as present in our patient, indicates an extensive involvement of the nerve, and in such a case the optic disk would usually show signs of atrophy, as a rule, occupying its temporal half—also present in our case.

In the early history of central amblyopes, the ophthalmoscopic examination is entirely negative, even the optic papilla has a normal appearance. At this period the pupillary reflexes are usually acute, hence the improvement of vision in such cases is marked where the direct light rays are thrown upon the test-types, the eyeballs at the same time being shaded from the intense light. The consequent enlargement of the the pupil permits the excitation of a greater area of the retina by the increased number of ethereal vibrations admitted to the interior of the eyeball. The same improvement in vision follows the use of a weak mydriatic solution that affects the sphincter iridis muscle only.

In some cases the acuity of vision is increased temporarily by the inhalation of the fumes of nitrite of amyl to its physiological effect, and it may be used to aid in the rapid, differential diagnosis between cases largely functional and those severer ones where atrophic change has supervened. Increased flow of blood to the optic tissues, from the occipital cortex to the macula, most probably causes the momentary stimulation of the still intact nerve elements.

These much-debated cases are not freed from discussion when their morbid anatomy is considered. The pathology of central amblyopia, as already outlined, is that of the other toxæmias,⁵ viz., a peripheral interstitial neuritis. The anatomical explanation for the central scotomata is that of retro-bulbar affection of the optic nerve fibres that are distributed to the central area of the retina, at first a specifically localized

The uræmic amaurosis, rarely seen, and usually after convulsions in kidney disease, rapidly developed into complete, but usually transient, blindness, has a central origin, and does not require our attention here.

disease of the optic nerves within the orbit. The exact location, in the optic nerves, of the nerve fibres supplied to the macular region, and between the latter and the papilla, and to the peripapillary portion of the retina—the seat of the central scotomata—is that of the outermost parts of the optic nerve-trunk next to its sheath. An inflammation of the sheath of the optic nerves with its extension to the connective-tissue partitions, especially of the peripheral temporal portion of the nerves, would readily account for the phenomena of these interesting cases. The diseased portion would include about one-third of the optic nerve fibres, and is most probably at first entirely a functional impairment due to exudative cause, followed at a later period, if the etiological conditions persist, by a pressure atrophy of the nerve fibres, and still later, in some cases, by progressive inflammation with subsequent atrophy of other portions of the optic nerves, with the usual increase of connective-tissue elements.

Some observers have regarded these case as due to an interstitial neuritis of the axial fibres of the optic nerves. Some consider, and with these we agree, that the fibres of the papillo-macular regions only occupy the central portion of the optic nerves behind the orbit, but that within the latter, and as we approach the eyeball, they lie nearest to the sheath and largely on the temporal side of the nerve; whereas, it is known that the axial fibres within the orbit are spread out in the anterior portions of the retinal expansion, and these parts are not included in the early period of central amblyopia. In our patient, however, they are involved, hence the case has passed beyond a pure one of central scotomata to that of progressive affection of the optic nerves, and renders the prognosis graver, because of the probability of serious, progressive, and permanent, but not necessarily complete, blindness. In this patient, we were asked for the immediate anatomical limitation of the disease that would explain atrophy of the temporal halves of the papillæ, the central scotomata, together with marginal or peripheral nasal and superior contraction of the visual fields, we would reply that, after the initial inflammation of the optic

nerve-sheaths the disease extended especially to the distal temporal portion the peripheral fibres of the optic nerves, and that the interstitial neuritis, with its base outward and its angle inward toward the centre or axis of the optic nerves, has now reached the axial fibres, and these being affected explain the peripheral contraction of the inner and the upper margins of the visual field; in short, more or less definitely wedge-shaped neuritis, with the widest part next the temporal portion of the sheath and its apex at the centre of the optic nerve-trunk, and situated immediately behind the eyeballs.

The prognosis in these cases depends upon the chronicity of the disease, the willingness of the patient to entirely forego his bad habits, for many of these cases, as Mackenzie said, "would rather smoke than see," and, we may add, would rather carouse than live. Again, the presence or absence of atrophic signs in the papillæ or the presence of a marginal scotoma, modifies the future outlook. The prognosis is favorable in first and recent attacks with slight central impairment of vision and where the bad habits are discontinued. When relapses have occurred, there is a possibility of the disease passing into a progressive atrophy with permanent, incomplete, or may be absolute, blindness.

In the early stages of the affection, with simple complaint of a slightly foggy vision, the central scotomata may be overlooked unless great care is exercised in the examination of the visual fields. Even at this period, however, the color perception is diminished in the area of the scotomata before there is much loss of the acuteness of vision. This is generally the case in all retinal or nerve disease followed by atrophy, and it is an important fact to be remembered in the observation of all such cases, and in doubtful ones the color sense ought to be carefully tested—small color objects being used in preference to large ones. In cases of early simple central scotomata the area of diminished, or lost color-perception is sharply defined, whereas in cases of progressive scotomata with atrophy resulting there is a zone of color uncertainty between the lost and normal fields. Moreover, in the progressive atrophies there is

present, sooner or later, marginal, and often concentric limitations of the visual fields. Also, in these cases, the temporal halves of the disks are obviously atrophic, as seen by their tendon-like appearance, and their evident depression below the level of the surrounding retina. It must be remembered that the typical central scotoma is always bilateral, and, at the commencement, never an area of lost but only of diminished vision. Paracentral scotomata have also been observed, either together with or independently of the central form.

The etiological indication is our guide to treat of central amblyopia, and applies to all forms of toxæmic neuritis. To restore the functional integrity of the nerve tissues and to limit further progress of the disease, stop entirely the introduction of both poisons—alcohol and nicotine—into the system, if both are used, or if only one is taken, see that it is interdicted. Restore the normal nervous tone by a carefully regulated life, good hygiene, fresh air, tonics, and a nutritious and easily-digestible diet. Iodide of potassium is an useful drug in these cases, especially where active ocular symptoms are present, vision improving, with a reduction of the hyperæmia and irritation. Dry cupping, or blistering the temples, together with a guarded general derivation by skin, bowels, and kidneys, is also followed by good results in non-debilitated patients.

For the more chronic cases with apparently permanent blindness, as well as for the general peripheral neuritis, the subcutaneous or internal use of strychnia is advisable. For the spinal neurotic pains the aromatic series of analgesics are to be recommended. Gentle galvanization of the eyes and extremities is followed by good result.—*Medical Record*.

NEWS.

THE PAN-AMERICAN MEDICAL CONGRESS.

Our readers well know by this time that the first Pan-American Medical Congress will be held in Washington, D. C., September 5, 6, 7 and 8, 1893.

The vast deal of preliminary work which such an occasion requires is steadily and satisfactorily advancing toward completion. A preliminary announcement sent out a short time ago by the able Secretary-General shows that the list of the different Sections complete and an array of brilliant names among the number of honorary presidents.

There is no doubt, that, the work being put into such able hands, the Congress will turn out to be a great success.

The needful thing, however, as in all such undertakings, is money. Dr. A. M. Owen, 507 Upper First St., Evansville, Ind., the Treasurer of the Congress is even now ready and has been for some time, to receive the registration fee, amounting to \$10.00, from all who intend to become members of the Congress. We gladly lend our help to this object in bringing it before our ever liberal readers. Remember the Treasurer now—and have a valuable paper ready for the Congress!

TRANSPLANTATION OF AN EYELID.

The following case is reported by Douthwaite (*N. Y. Med. Jour.*): A Corean official had lost part of the lower eyelid, and prevailed upon a slave for a consideration, to furnish his

own eyelid for transplantation. Both men were chloroformed and the margin of the official's eyelid was prepared first by scraping and then making a deep slit along its whole length. The lower lid of the slave was then seized and its margin slit off in a wedge-like piece, which was quickly inserted into the slit prepared for it in the other eyelid and adjusted by means of fine sutures. It was then washed with a 1-to-1000 bichloride solution and a pad of antiseptic lint was applied. On the second day the circulation was fully established in the transplanted tissue and the eyelid looked natural. On the third day everething was doing as well as could be desired, but that night, while half asleep, his eye feeling somewhat uncomfortable, the patient gave it a vigorous rubbing with his hand, which completely ruined the work that had been done. Douthwaite believes that with the observation of greater care the operation would probably have proved successful.

THE FAMOUS OCULIST, DR. HIRSCHBERG, of Germany, who recently arrived in the Empire, was received with open-hand welcome by many of his old students. He is now staying at Nikko, but as soon as he returns to Tokyo, all the eminent physicians of the city will be ready to invite him to a grand banquet which is now being prepared.—*The Sei-i-Kwai Medical Journal, Tokyo, Japan.*



THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. IX.

DECEMBER, 1892.

No. 12.

ORIGINAL ARTICLES.

TEMPORARY VISION RESTORED TO A SIGHT- LESS EYE BY AN ACCIDENT.

BY S. MITCHELL, M.D., HORNELLSVILLE, N. Y.

Oculist and Aurist to St. James' Mercy Hospital.

Accidents to eyes that destroy the vision are so common that nearly every practitioner of medicine has a record of one or more cases of this sort indelibly stamped upon the tablets of his memory; not so common, however, are the cases where vision has been restored to a sightless eye by an accident.

Several oculists have reported cases that have come under their observation where quite useful vision has been restored to eyes that were blind from cataracts by the dislocation of the cataractous lens backward into the vitreous chamber. Sometimes through traumatism, but more often there was no history of any accident having occurred to the eye. In the majority of cases that have been reported, I think the dislocation has taken place while the person was asleep, brought

about no doubt by the weight of the lens causing a rupture of the wasted and weakened suspensory ligament while the person was in the recumbent position.

All who have had much experience with the extraction of cataracts will have met with an occasional Morgagnian cataract where the suspensory ligament had become so frail that it was easily ruptured by the upward pressure of the vitreous, as the aqueous escaped, and the lens thus been caused to present, at the section in the cornea, as soon as it was completed, and to be delivered, in its capsule, without much assistance from the operator.

The following case, however, was not one blind from cataract, but occurred in an eye where the sight had been lost from the ravages of purulent ophthalmia, probably of gonorrhœal origin.

George W., a farmer, aged 45 years, married, living in an adjoining county, called on me Oct. 17, 1892, for treatment of his left eye. The most that he could tell about his trouble was, that about one week previous his eye became inflamed and painful. His family physician had prescribed something for a wash, and nearly all of his neighbors had each suggested a different poultice, but the trial of each in turn did not seem to improve the eye, which fact was very evident to me when I looked upon the ruin they has fostered.

When the bandages were removed from the suffering eye I found them saturated with thick, yellow pus, and the same oozing from between the swollen lids foretold the hopeless condition of the eye, ere I parted the lids to examine it. When I did so I found great chemosis of the eye; the cornea necrotic, with a large central perforation, and the anterior chamber filled with pus. Vision, of course, was zero. I informed him of the hopeless condition of the eye, and advised its early excision.

The eye was freely washed with a solution of bichloride, 1 to 2,000, and the same given to him, with instructions to keep the eye thoroughly cleansed with it. He called again on the afternoon of the second day, having returned to his farm in

the meantime. He was suffering great pain in the eye, which, he said had been greatly intensified by a blow received upon the eye that morning in the following manner: While attending to his cattle, one of the animals dealt him a blow with its tail, the full force of the blow being received upon the suffering eye, which was covered with a compress of cotton and bandage.

Upon examining the eye I found that the blow had dislocated the crystalline lens and forced it forward into the perforation in the cornea. There it was resting in perfect position for sight, a thing of beauty amid all the corrupting influence surrounding it.

My patient's first exclamation was, as he opened the eye: "You can't take that eye out! I can see you as plain as day with it." True enough, he could see with it. I had him sit up and look at a card of test-type, and found the eye that two days previous was sightless and fast going to destruction was now possessed of vision $=^{15}_{xxx}$.

He was quite jubilant over the matter, but I hastened to inform him that this accidental return of vision was brought about by a circumstance that only marked another step toward the final doom of the eye.

Two days later I again saw him and found that the lens had ruptured and, of course, the "window to his soul" was forever darkened. I again urged enucleation, to which he consented. He returned home, after receiving instructions about watching the fellow eye for any symptoms of sympathetic irritation that might arise.

At the end of ten days he again appeared at my office, ready now to have the eye removed, which was accordingly done the following day. No bandage was applied, the open treatment being followed.

At the end of two days he was feeling so well that I allowed him to return home as he was anxious to be where he could look after his crops as well as his kine, which included among their number one, whose wonderful achievement in ophthalmology is here recorded.

SELECTIONS.

EYE-PARALYSES.¹

BY JOHN AMORY JEFFRIES, M.D.

[This paper, which Dr. Jeffries had nearly finished at the time of his death, has been put in my hands to prepare for publication. Although I knew something of his intentions in regard to it, a study of the paper itself and of the mass of material which he had called on the subject has convinced me of the difficulty of completing the task as he would have done it. With the exception of a few verbal changes, I have done little except to prepare a bibliography from the notes which Dr. Jeffries left, and to indicate in brackets the references to illustrative cases. Not having the original articles at hand and depending almost wholly upon these notes I fear that the classification of the cases, which I have tried to make, is not always correct, and that it might not agree with Dr. Jeffries' greater knowledge. I have added Bleuler's diagram, which Dr. Jeffries had copied, probably with the intention of inserting it.—P. C. K.]

Probably every practitioner has at times been in doubt as to the nature of a case of eye-paralysis. The whole question is involved in practical difficulties. A patient complains of double vision; and it is evident, unless the case be one of monocular diplopia, that at least one of the twelve extrinsic muscles of the eyes is paretic. In theory, the changes in the relative position of the images in different parts of the visual field should lead to an accurate diagnosis; in practice, owing to the complex results produced when a number of muscles are affected, and to the stupidity of patients, the result is often far from satisfactory. Even when the eye distinctly lags in following an object, it may be difficult to determine the condition of the oblique muscles. When, as sometimes happens, the patient

¹Read before the Boston Medico-Psychological Society, March 17, 1892.

fixes with the paretic eye, there is danger that the trouble may be assigned to the wrong eye. The paretic eye is used for fixation when it has the best sight or when it is specially trained, as in the case of the right eye in surveyors. It is therefore desirable to make a systematic study of every case of eye-paralysis with all the methods at our command.

For this purpose it is necessary to have a pair of spectacles carrying plane glasses, one colorless, the other red, so that the color of the image may indicate to which eye it belongs. After assuring one's self that the diplopia is not of monocular origin, by having the patient look first with one eye and then with the other, the whole field should be tested with some bright object, as a candle-light, and the result noted in a chartlike manner.

The relative position of the images, their parallelism or obliquity, the distance between them, and which is red, should be determined for at least three points directly in front of the patient, and for two tiers on each side representing half-way and full lateral vision. When, as is often the case, vision is impaired as well as the motions of the eyeball, care must be taken lest monocular vision due to lack of vision in the peripheral portion of one retina be mistaken for proof of parallel vision. After this, near vision should be tested in the same way.

The double images had better be studied first, since they require close attention on the part of the patient and error is not easily recognized by the examiner.

It must be borne in mind that lack of double vision does not prove the absence of paralysis. One of the images may be disregarded, lost, or there may be but one, as in cases of conjugate paralysis, where there is constant parallelism of vision even though motion to one side is absolutely lost.

This is hardly the place to go into the details of the position of the images. They have been so fully worked out and figured in the various works on the eye and nervous system as to be familiar to all. Those interested in the difficult subject of double paralysis of the superior obliques will find the subject

elaborated in a recent article by Pflueger.¹¹⁴ This paralysis is probably best recognized by the perimetric method.

Next the motions of the eyes should be observed when following some object, as a finger, a piece of paper, or the like. With practice very slight deviations, from the normal can be recognized in this way. Not only the parallelism of vision, but the range of motion should be noted also the position of the lid, and whether it follows the pupil in looking down or not. Very good motor charts can be made by Landolt's method in cases where the defect of motion is considerable. This consists simply in substituting a card with letters on it for the plain moving card of a perimeter, and after having instructed the patient to follow it as long as he can and still read the letters, slowly move the card from the centre to the periphery. The point where distinct vision ceases should be noted on any of the charts used in plotting out the field of vision. A muscular defect shows itself as a limitation in that part of the field towards which the weak muscle should have moved the eye. The method is based on the fact that the letters cannot be read unless their images fall on or very near the visual axis of eye. Those who have not used this method, might think that it was entirely dependent on the promptness and accuracy of the patient's replies. This is not the case, as the reflections from the cornea render it very easy for the physician to recognize the faintest motion of the eye. Of course, this method fails entirely in those relatively rare cases where the paralysis is dependent upon binocular vision.

Several other factors remain to be determined which are more physiological in their nature; thus, it should be noted if there is any difference in the motion of the eye when its mate is covered. A quite marked or even complete paralysis may vanish at once if the other eye be covered, while in others the paralysis is only apparent after the other eye is closed. Secondary deviation of the sound eye should be noted by placing a screen between the eye to be tested and the object gazed upon, and then removing it; if the deviation exists, the eye will be seen to fly back a few degrees as the object comes

into view. It is due to the correlated muscles of the sound eye rotating the eye beyond the parallel vision, from sympathy in the effort required to fix the object with the paretic one. Hence, the direction of the motion is that in which the other eye is weak.

In making this test the screen should be held sufficiently near the eye to prevent fixation being performed by it and yet in such a way that the eye can be seen by the observer. The readjustment of vision is at times very quick, and the process may be finished before it can be noted.

False projection, if well developed, is also a factor of considerable value. This—the failure properly to locate objects in space—is held to be due to our judging of the relation of objects to ourselves not primarily by the position of their images on our retinae, but by the state of contraction of the extrinsic muscles of the eye. We first determine the direction of the objects falling in the line of distinct vision by the eye muscles and then locate the rest of the field by means of the relation of the peripheral images to the centre of the field. As a result of this, if a small object—say a pin stuck into a table—is fixed with the paretic eye and the patient be instructed to pick it up quickly the hand will miss the object and go too far in the direction towards which the motion of the eye is weak. Of course, in making this test, the other eye should be closed, the motion made rapidly, and the pin placed so as to involve the use of the affected muscle. When the paretic eye is closed, no false projection occurs, and the hand goes straight to the object. When both eyes are open, false projection in the opposite direction may result from overaction of the muscles of the healthy eye. When both eyes are affected, the last two tests often give most perplexing results.

Besides the above, the reaction of the pupil to light, near vision, and sensations from the skin should be noted as well as the action of the ciliary muscles. At the time of, or shortly after, the occurrence of a paralysis, the eye is apt to deviate in the opposite direction, owing to the contraction of the antagonists, the same as in other parts of the body. But, in spite

of this, the eye is often able to move in the direction of the paralyzed muscle as far as the mid-point.

The result of the examinations gives us a knowledge of the muscles paralyzed, the degree of paralysis, and the conditions under which it occurs. These facts have still to be correlated with what we know of the physiology of the eye, both normal and pathological, as well as with the results of clinical observation and post-mortem examination before a full diagnosis can be made, and the physician be truly said to understand the case. A full diagnosis calls for a determination not only of the parts paralyzed, but also of the portions of the nervous system affected, and the nature of the affecting process. Fortunately for the patient, the second part of the diagnosis has little to do with treatment; only in surgical cases is an exact knowledge of the seat of disease called for by therapy.

The physiology of the muscles of the eye is by no means a simple problem; not only do we have to explain how the muscles bring the eyes into the proper position, but also to trace out the track through the nervous system by which this is affected. In the normal inactive state, where vision may be said to be in abeyance, the eyes rest in a mid position and with nearly parallel visual axes. I say nearly, because on several occasions I have thought that the eyes did not correspond by a few degrees, the same as is common in the blind. Now, if an object to one side of the axis attract attention, the the eyes are at once turned so that their axes are brought to bear upon it. This is done by the equal and synchronous action of the internal rectus of one eye and the external rectus of the other, and if the object is not on a level with the eyes, by the action of the muscles turning the eye up or down (superior rectus and inferior oblique or the reverse). This process, lateral conjugate deviation, has attracted much attention, and yet we do not know how it is brought about. Starting with the experiments of Mott and Schaefer^{95, 96, 130} and others, we know that this motion is produced by stimulation of the middle portion of the frontal lobe just in front of the head area, the eyes turning to the opposite side. Again, stimulation in the visual

field in the occipital lobe causes the same motion, but in an opposite direction—that is, the eyes turn to the side stimulated. Lastly, if the seat in the occipital region where the eyes are turned to one side and that in the frontal region where the eyes are turned to the other are stimulated synchronously with the same current, the motion induced by the frontal area prevails over that of the occipital.

Over and above this, conjugate motion is liable to be induced by stimulation almost anywhere in the cortex. Such conjugate paralysis or deviation has been well recognized since the thesis of Prevost¹¹⁸ and is one of the most constant early symptoms following almost any sudden gross lesion of the cerebrum. During the comatose period, if there be any, the eyes will be found turned as if looking to the sound side. When consciousness returns, the eyes may still continue in their former position, or assume the normal one. If still turned to one side, a true paralysis may exist, or the position may simply be one of selection, the eyes being able to follow an object well to the opposite side. In either case the trouble usually vanishes in the course of a few hours or weeks, and the eyes return to a normal state. Since in pontine trouble the paralysis is crossed with that of the limbs, the symptom is at times of value in locating the lesion.

In a small proportion of the cases the deviation remains constant, as a permanent paralysis, indicating that the motor region or fibres have been actually injured and not simply disturbed in their functions. Efforts have been made to use this symptom for purposes of localization, but so far with poor success. Thus Wernicke¹⁶⁴ holds that such a paralysis coming on with a shock without loss of consciousness points to disease of the lower temporal region of the opposite side, and cites a few cases beside his own. They are, however, far from satisfactory.

There is a small number of cases where disease of the frontal convolutions has been accomplished by disturbance or paralysis of the eyes of such nature as to suggest some close connection with the lesion, but they are far too few and vague

to justify any conclusions, though seeming to tally well with experiments on animals.

As we do not know whence the motions of the eyes spring, it goes without saying that we do not know the course of the fibres conveying the impulse to the nuclei at the base of the brain. They probably pass down in the anterior part of the internal capsule and thence, via the pyramid tracts, to near the nuclei of the third nerve where they cross. Perlia¹¹ describes a set of fibres which, coming from the crus, turn and pass back along the raphe and then enter the nuclei from their free surface; these seem to be best explained as being the lower end of the cerebral fibres. The fibres to the sixth nuclei also probably crossed somewhere in the same region, since in pontine trouble paralysis of the sixth nerve is always on the same side as the lesion. The sixth nucleus is placed under the eminentia teres in the angle formed by the knee of the facial nerve. Its root fibres pass down and out; the course of its cerebral fibres is not known.

Conjugate deviation in cases of pontine disease is of far more diagnostic value than when springing from disease higher up, and has, since Foville³⁸ first called attention to the subject, offered material for much discussion and many theories. In 1885 Bleuler⁸ collected the cases and made a very material contribution to our knowledge of the subject; recently I have been at some pains to go over the literature and have been able nearly to double the number of cases with autopsy collected by Bleuler. Even a brief citation of these would swell this article far beyond all limits, nor in view of Bleuler's article is it necessary; but as they show several points of importance, a close summary is required. Owing to the internal recti being supplied by the third nerves, while the external recti receive their fibres from the sixth pair, lesions in the pons are liable to split up conjugate motion into its separate elements.

The following different states are found to exist:

(1) Complete paralysis of one external rectus and the crossed internal rectus, so that neither muscle is capable of any motion, the eyes looking forward or to the other side

according to the state of the opposite pair of muscles. In these cases the eyes turn readily to the opposite side, up or down, but stop at the midline as if transfixed.

(2) Precisely the same state as in the first condition except that the internal rectus acts perfectly for near or convergent vision.

(3) When both eyes are open, the eye with the paralyzed internal rectus will not turn in for objects on the other side of the nose, but will if the other eye be covered.

(4) The internal rectus will not act in conjugate, but will in near vision; the external rectus being normal.

(5) Though devoid of any signs of conjugate paralysis we must consider simple nuclear sixth nerve paralysis as an element of conjugate paralysis.

[Dr. Jeffries told me that he had omitted to speak fully of the cases in this first class, in which the conjugate paralysis was complete. I find in his notes references to eleven cases, which seem to belong here: those of Leyden,⁷⁴ Bernhardt,⁵ Ballet,¹ Broadbent,¹³ Desnos,²⁰ Meyer,⁴ Folville,³⁸ Garrel,³⁰ Wernicke,¹⁶⁵ Mills,⁴⁶ and Webber,¹⁷¹.]

In all these cases there destructive lesions which, as far as can be judged from the report, involved either a considerable area in the pons above the nucleus of the sixth nerve or involved the pons immediately below or in front of the sixth nucleus on the paralyzed side.

In the second group of ten cases [Kahler and Pick,⁶⁷ Fereol,³² Vincentiis,¹⁵⁹ Mills,⁴⁹ Hofstetter,⁵¹ Grasset,¹⁷ Poubin,¹¹⁷ Blocq and Guinon,⁹ Finny,³⁷ Graux,⁴⁹] eight showed a lesion just below or at the eminentia teres. It was in most cases small or at least did not effect much tissue in this region. In the other two, those of Mills,⁴⁰ and Hofstetter,⁶¹ the lesion was a good-sized tumor in the upper quarter of the pons. The symptoms in the first case do not appear to have been in any way peculiar. In Hofstetter's case there was simply a paresis of conjugate motion and no deviation to the opposite side.

I have only found five cases [Bleuler,⁷ (two), Spitzka,¹¹¹ Quioc,¹¹⁰ Samelsohn,¹²⁶] where it is clearly stated that the eye

with the paralyzed internal rectus turned, as in conjugate motion, to the other side when the other eye was covered. This is how this comes about. To all appearances the suppression of the eye with the paralyzed external rectus restores power in the other, as if its weakness were due to sympathy and not to actual paralysis; but such an explanation not only fails to explain, but stands in marked contrast to peripheral paralysis of the sixth nerve where this action does not occur. There is nothing peculiar in the autopsies; in two there were tumors of moderate size below the sixth nucleus. In Bleuler's, ⁴ two cases the tubercles, though diffuse, especially attacked the sixth nucleus. In Spitzka's, ¹⁴ the tumor, though extensive, apparently spared the floor of the ventricle along the raphe.

The only way out of the difficulty is to assume that the apparent conjugate motion in monocular vision is in reality a convergent motion substituted in its place. In this case we might expect the covered eye also to turn in and the pupils to contract. If either occurred, it would be fair to hold the point demonstrated. Unfortunately, in none of the cases has either been noted. But there are cases without autopsy, evidently of the same nature, in which this has been found to be the case. Also the obverse is known to occur in paralysis of convergence. If this view be correct, this group is really identical with the preceding.

There are three cases which apparently belong to the fourth group. Koechlin, ⁷¹ reports the case of a boy three years old who after a month's sickness developed a decided deviation of the right eye to the right, and left facial paralysis. The tongue was projected straight; the pupils were equal; the limbs normal and the mind clear; pulse 112. After the paralysis had existed for a month, meningeal symptoms developed, and the child died. At the autopsy the only possible cause found for the paralysis was a tubercle adhering by its base to the floor of the fourth ventricle on the left side at the level of the angle formed by cerebellar peduncles. The region of the third nerve nuclei was normal.

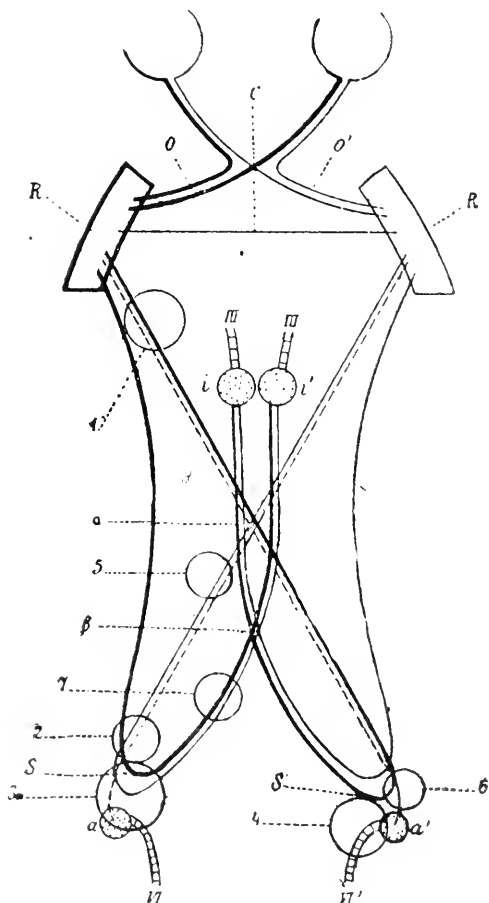
Hunnius ⁶² reports the case of a man forty years old who

had appoplexy. Two days later, up and down motion of the eyes was normal. There was absolute loss of power in the left external rectus, and the two internal recti; convergence and binocular vision could only be executed with difficulty (!); left conjugate motion lost; left eye in mid-position; right turned out forty degrees. Spinal myosis; marked dysarthria; right hemiplegia. Paralysis of right facial, the upper branch being least affected, and right hypoglossus. Head carried turned to the right, but can be turned anywhere. Mind clear, vision good, no nystagmus. By the fifth day the left eye had turned in a little, and the right was not turned so far out, only parallel to left. No other change. Death from pneumonia on the twelfth day. All the cranial nerves normal; softening in the left half of the pons beginning back of its anterior limit and most extensive in the middle. Part of the sixth root apparently implicated, but not the nucleus. Pyramidal tract entirely destroyed.

In the third case reported by Schuetz ¹³² a woman forty-eight years old, after two weeks of weakness, was suddenly seized with paralysis and difficulty of speech, without loss of consciousness. On the fourth day there was diffuse headache, stertorous respiration, rapid pulse, but no œdema. She understood well, but spoke with difficulty. The head was freely moved, there was ptosis on the right, and the left eye did not turn in and down with the right; otherwise, motions of eyes normal. The pupils were small, the left angle of the mouth paretic, the tongue turned to the left. There was slight rigidity of all four limbs, and the right were paralyzed. At autopsy the vessels were found contorted, the ventricles enlarged, the the endyma thickened, and a pair of small cysts the size of peas in the thalami. Also in the upper half of the pons an irregular hæmorrhage, larger than a hazel-nut, in the region of the left seventh nucleus, which spared the lower parts on the left of the right half of the pons.

In the first case Guebler ⁵⁰ has already given the interpretation accepted by me; the second case belongs, as far as loss of left conjugate motion is concerned, to the second group.

It is only the internal rectus of the left eye which is here of interest. This acted in convergence and not in conjugate motion. The presumption is that the fibres of the third nerve



system, affected in association with the system of the sixth nerve in conjugate motion, were here affected alone; but the autopsies are too vague to aid in plotting out the position of the fibres.

There is one case (Eichhorst ²⁶) of simple deviation of the eyes and no paralysis due to a lesion in the pons. A man forty-seven years old and a syphilitic, fell in coma after a few hours of moderate pain in the head. On return of consciousness there was right hemiplegia, motor aphasia, relaxation of right side of palate, right facial paralysis, dysphagia. The face and eyes were both turned to the right, but could be moved freely in any direction. There was also a tendency to lie on the right side. The pupils were much contracted and the light reflexes lost. Sensorium free. Death occurred on the eighth day. A clot was found in the anterior part of the basilar artery, and the pons was very soft in the anterior part of the left half. The softening extending nearly to the floor of the fourth ventricle. The cerebellar peduncles were normal. A fissure of the basal surface of the pons shows that the softening involved the lower half of the crus.

To my mind, this is not a case of conjugate paralysis but one of forced rotation to the right, a symptom frequently associated with conjugate paralysis. There was no paralysis

EXPLANATION OF FIGURE (FROM BLEULER.)

- O O', Optic tracts.
 R R', Cortical centres.
 a a, Abducens nuclei.
 i i', Internal rectus nuclei.
 S S', Point where the internal rectus fibres bend.

1. Lesion producing Prévost's symptom.
 - 2, 3. Lesions producing paralysis of one abducens and the opposite internal rectus for all movements.
 4. Lesion producing paralysis of one abducens and weakness of the opposite internal rectus for all movements.
 5. Paralysis of left abducens, absolute defect of right internal rectus for associated lateral movements, weakness of both internal recti for convergence.
 6. Paralysis of abducens and inactivity of opposite internal rectus for lateral movements only.
 7. Total paralysis of opposite internal rectus.
- a, Double abducens paralysis.
 B, Paralysis of convergence.

of the eyes. All the cranial nerves affected were on the same side as the hemiplegia, and the figure in spite of the text shows the lesions to be in the crus.

Since a central paralysis of the sixth nerve is an essential part of a conjugate paralysis, they are best considered in this connection. Bleuler⁸ has classed a case reported by Grasset⁴⁷ among those of conjugate paralysis, which to my mind belongs to this group. The head, eyes, and body turned to the right, but the right eye could be turned to the left, while the left could not. Autopsy showed several small sarcomas, two of these being in the left half of the pons. This case seems to be in reality one of conjugate deviation of the eyes to the right and paralysis of the left sixth nerve.

My collection of simple paralysis of the sixth nerve dependent upon injury in the pons offers nothing peculiar in their character. There does not seem to be any point of distinction in action between the different parts of this system. In all, if not from the first, there have been before long other symptoms pointing to the pons. Some cases have begun as conjugate paralysis, and then become simple sixth paralysis; in others the obverse has been the case. In the first group the lesion has been a hæmorrhage at the eminentia teres. I have myself seen the two states alternate from time to time. Though there is no autopsy, a brief summary is given, as the case is of some interest. (No record of this case.)

Considerable ingenuity has been spent upon the explanation of the mechanism of conjugate paralysis, and various theories evolved. Most of these involve either the existence of a special nucleus beside the sixth nucleus for conjugate motion or fibres arising from the sixth nucleus and ending somewhere in the line for the internal rectus, either in the nucleus of the third nerve or the nerve itself. No one has pointed out the nucleus barring Gowers,³³ who suggests the olivary body, but as this is healthy in many of the cases it needs no consideration. The various fibre tracts have been pointed out by one or another, but not in such a way as to convince the doubter. None of these hypotheses stand in harmony with the facts.

Bleuler has advanced a theory which was compatible with the facts up to his time of writing, and it holds good for the more recent cases. According to this, the fibres run direct from the cortex to their respective root nuclei, but there are two sets of fibres for the internal rectus, one for conjugate vision and one for near vision; the fibres run down as separate bundles below their nucleus close to the sixth nucleus, and then turn back and cross to their nucleus. There is no physiological objection to this theory, and it coincides well with the results of pathological investigations—indeed, it was built up from the best summary there is on the subject. It does demand the two sets of fibres, something not held to exist in any other part. On the whole I believe it to be the best working theory we have. The only other way of looking at it seems to be that there is but one set of fibres, these going close to the sixth nucleus, but that the impulses descending from above in conjugate and near vision are different, and that the conjugate impulse is more easily interrupted than the near vision impulse; the nearest analogy being the different results obtained by the stimulation of a nerve as shown by Hooper and Bowditch, and the selection of the extensor muscles in most hemiplegias. Any such theory of course ignores the idea that each muscle is represented by certain nerve fibres, cells and areas, which transmit the force after the style of a complex system of bell cords,—an idea which seems in silence to be creeping into neurology, but does not tally well with complete recovery after resection of a nerve. One can hardly imagine that in these cases the cells in the cord establish their old relations with the muscles. If not, and the pull cord theory be correct, utter confusion should result when any motion is attempted.

Whatever the theory may be, the practical point remains that all cases of partial conjugate paralysis so far reported have depended upon lesions of the pons.

A few cases with autopsy have been reported in which conjugate paralysis of up or down, but not of lateral motion existed [Thomsen,¹⁵¹ Nieden,¹⁵² Hoppe,¹⁵³ Henoch,¹⁵⁴ Gee¹⁵⁵]. Of these

I have collected a few cases and have been unable to procure the records of several others. Some are cases of pure paralysis of up or down motion, others are complicated by other pareses, but nevertheless this form of conjugate paralysis was the leading factor in the case. In all of these a lesion has been found at the level of the nuclei of the third pair, and in all but Thomsen's¹⁵⁴ case the disease has been central. As this case is of extreme interest it is given in detail.

A man, forty-eight years old, slowly developed the following state: Viscera normal, mind feeble; pupils small, right larger than left, a trace of the light reaction in the left, but none in the right. Lids drop in rest, but can be well opened. Both eyes moved to a normal extent to the right, to the left, or down, but always with nystagmus. A marked paralysis on looking up, the eyes turning scarcely above the horizontal plane. Monocular vision the same, except that the right eye is less movable than the left. No changes in the state of the eyes to death one month later. The arms were weak and tremulous, the legs weak and slightly spastic with normal knee-jerks, but ankle clonus. The urine escaped at times, and the gait was unsteady and spastic. Autopsy revealed a moderate amount of chronic meningitis, thickening of the ependyma, a few sclerotic patches in the cord, and a partial degeneration of both the anterior and posterior roots. Also a gumma at the point of exit of the third nerves between the corpora mammillaria and the crura. In the left only a small portion of the crus and substantia nigra were affected, while on the right the growth involved the lower portion of the red nucleus, the median third of the substantia nigra, and less of the crus. The right third nerve was extensively degenerated, the left but slightly. The nuclei of the third nerve were normal.

Thomsen classes the case as one of peripheral paralysis, which to my mind is a mistake. Though the lesion was peripheral to the nuclei, it was still in the brain. The substantia nigra and red nucleus can hardly be called peripheral structures. It seems clear that the lesion involved the nerve fibres destined for the superior and inferior recti.

The only other associated motion of the eyes is that of convergence in near vision. In this motion the eyes both bring their axes to bear on the subject, and owing to its nearness the axes converge. Contraction of the pupil and accommodation are normally associated with it. Commonly the object looked at in near vision is in front of the face, and hence the contraction of the internal recti are approximately symmetrical; but even in running the eye across a page this symmetry is broken. The extent to which lateral near vision can be practised appears to be very variable. In some cases as soon as the object is passed but a slight distance to either side of the nose, the pupil dilates, vision is poor, and the eyes become parallel, indicating the substitution of conjugate for convergent vision. In other cases the object can be carried so far to one side that one eye looks at the nose and the other is well turned out before the break comes. In all whom I have examined, even with the other eye covered, near vision does not occur when the object is far to one side.

A good many cases of paralysis of near vision have been reported, but unfortunately as yet there are no autopsies. [Cases by Barel,³ Ferles,²⁵ Parinaud,^{108, 110} Peters,¹¹² Stolting,¹⁵⁰ Grafe,⁴⁵ Pilz,¹¹⁵ De Watteville,²¹ and Binsler.⁷] Some of the cases are suggestive of an hysterical state, but the mass of them point to gross disease. A centre of convergence has been assumed to exist in the anterior part of the third nuclei, but as yet nothing definite has been shown. Hensen and Voelckers'⁵⁵ experiments—which do not tally with others—at the most do not demonstrate a centre; irritation at a point of crossing of fibres would produce the same effect. Thus, if, as suggested above, the fibres governing convergence come down to near the sixth nucleus, ascend and cross to their nuclei, stimulation at this crossing would produce convergence. Whatever the mechanism this paralysis is just the obverse of lateral conjugate paralysis. With both eyes open, neither will turn in but cover one and the other comes in at once, while the covered turns out to a parallel position. The case reported by Binsler⁷ may be taken as a typical example. A band-man

previously well, ran to an appointment, and while blowing on the horn, suddenly lost sight of the music and had to stop playing. Careful examination showed that distant vision was good, but near vision poor and accompanied by crossed diplopia. When one eye was covered, the other turned in well for near vision, the covered eye turning out at the same time. The right pupil reacted to light, but did not to accommodation. Sense of cold less distinct on the right side than on the left. No other symptoms, no change in six months.

We have left to consider the great mass of eye paralysis, which simply affect one or more muscles and do not tend to select associated functions. In these cases we are deprived of a most valuable guide in localization, and are obliged to fall back on what other symptoms may be present, and a few isolated points of value. As is now well known, the nuclei of the fourth nerves lie just behind those of the third nerves, and practically form a unit with them. The nerves themselves, however, instead of passing down from the nuclei to the lower surface of the pons, go up and cross above the aqueduct before issuing from the brain. As a result, the crossing gives an occasion for double fourth nerve paralysis, without involvement of the other nerves; which the peripheral course of the nerves does not readily lend itself to. Though no cases of the isolated paralysis of the superior obliques have been reported, there are those of Christ's¹⁷ and others in which this symptom has been used with good success.

There are few other factors of importance in the distribution of the paralysis. Mauthner²¹ and others have held that a peripheral paralysis of the nerve trunk was complete or practically evenly distributed among the various muscles supplied by the nerve, while a paralysis due to disease in the base of the brain was commonly incomplete or irregularly distributed. Thus the intrinsic muscles of the eye alone might be affected or some of the muscles of the third and not the others; the reason being that while the nerve is compact and small and therefore not easily partly affected, the nuclei of the third nerves are strung along the floor of the aqueduct and the posterior part of the

third ventricle in the form of several sub-nuclei. Various efforts have been made to determine the functions of these sub-nuclei, but so far little, if anything, beyond speculative results has been obtained. Anatomy shows that there is a median nucleus common to both third nerves, and that posterior dorsal nucleus sends fibres across the raphe to the opposite third nerve. As a general axiom Mauthner's position is undoubtedly true; but, as the case of Thomsen already cited ¹⁵⁴ and the following show, it is not absolute. Oppenheim ¹⁰² has reported two cases of brain tumor which appear properly to belong here. In the one there was paresis of the right third and sixth nerves, and of the left internal rectus from a tumor the size of an apple chiefly in the basal part of the right frontal lobe, but extending some to the left frontal lobe. In the other there was complete paralysis of right internal rectus with a tumor in the right temporal lobe which pressed upon the lower parts of the brain and third nerve. Meyer's ¹ cases of multiple neuritis also bear on this point.

Another symptom of value is the variableness of the paralysis. Most true, peripheral paralyses tend to run a definite course, and do not change rapidly, indeed from minute to minute, as is not uncommon in central cases. This is naturally explained by the nerves being little more than conductors, acting when isolated from the body, while the centres discharge and generate force. As a result of this it is not rare to see a slight paresis grow during the course of an examination into a paralysis, and new paresis develop. From the same cause the paresis is apt to show itself at night or evening and not in the morning.

But the above characteristics are of use in only a small part of the cases; in the majority we must rely on the general symptoms and etiology for our diagnosis. There are a number of diseases which from their importance require consideration.

In tabes, as has long been known, there is frequently a history of transitory diplopia during the prodromal period. A patient sees double on and off, just for a moment, particularly at night. The time is fixed partly by the causes already

referred to, and partly by the fact that lamps afford a close test of the eyes. When the eyes are tested no signs of paralysis are detected. In another group, usually more advanced, a positive paralysis exists, an external rectus is weak, convergence is poor, or they see double in the upper stories of the houses as they pass along the street. These paralyses may in their turn pass off in a few days, give place to others, or remain fixed. The origin of these fugacious paralyses is not known, but their significance when combined with previous syphilitic infection is gravely suggestive of tabes to follow. The more fixed paralyses are apparently due to a mixture of causes, the most common being a thickening of the ependyma and an extension of the process into the nuclei and fibre tracts; another is syphilitic infiltration about the roots of the nerves before they are combined into a compact bundle. Endarteritis and its results do not apparently play an important part in these early paralyses.

The later and general paralyses of the eye occurring in tabes are usually classed as cases of ophthalmoplegia. These are characterized by their irregular distributions, extent and persistency.

Paralysis of the eye muscles is by no means rare in cases of multiple sclerosis. Uhthoff¹³⁷ found seventeen cases in a hundred. These cases are classed as follows: Two of double sixth paralysis, four of single sixth, three of third nerve, all partial; two of lateral conjugate, one of two conjugate, three of convergence, and two of ophthalmoplegia externa. It will be noticed that the paralyses are all limited, do not tend to include the whole of the third nerve, but only affect one or two muscles, or an associated motion. They tend to be more closely limited than in tabes.

Tumors involving the corpora quadrigemina, the pineal or pituitary gland are very apt to cause paralysis in the branches of the third, together with a peculiar form of ataxia and impairment of sight, but there is nothing in the paralysis itself to indicate the nature of the lesion, except perhaps in cases of paralysis of up-and-down motion. The diagnosis of the nature

of the lesion must be based on the general symptoms of tumor and the fact that other lesions are rare in this locality. In a summary of 29 cases Christ ¹⁷ found paralysis of the third nerve in 22, of the fourth in six, and of the sixth in nine cases.

The so-called cases of ophthalmoplegia externa require notice. In 1879 Hutchinson ⁶⁴ called attention to a group of cases in which a progressive fairly symmetrical paralysis of the muscles of the eye-balls formed a predominant symptom among a group of scattered bulbar paralyses and general cerebral symptoms. Since then the limits of this group have been extended so as to cover all general eye paralyses apparently of central origin and thus any value which may have attached to the name has been lost. To-day a diagnosis of ophthalmoplegia is about as significant as one of stomach-ache. The twenty odd cases in which there are fairly good autopsy reports, some being monuments of labor, skill and knowledge, show a great variety of processes.

A few groups, however, can be separated out, with a fair degree of accuracy:

First, there are the cases of polio-encephalitis of Wernicke represented by Gayet's case, ¹⁰ Wernicke's ¹⁶⁷ three cases, and Thomsen's ¹⁵⁵ two cases. In these cases there was but little paralysis except of the eyes, but in all mental disturbance, active delirium or somnolence, a staggering ataxic gait, tremor and the general signs of severe brain disease. At the autopsy a marked injection of the vessels, and numerous miliary hemorrhages throughout the central gray matter of the third ventricle, aqueduct, and fourth ventricle have been the principal trouble. The process has also in some cases been diffused in the whole of this region. In others, more or less extensive degeneration of the nuclei has also been present.

In Hutchinson's case ⁶⁴ the process is given as a nuclear degeneration, the same as in muscular atrophy, a pathology with which the symptoms well accorded. Some of the cases of diphtheritic paralysis also appear to partake of the same nature though peripheral trouble is present. These cases are slower than those of Wernicke's group, and lack the high degree of

vascular change and acute symptoms, but seem to be allied to them by a certain amount of vascular change and the nuclear degeneration.

A second class is represented by the cases of Dubois,²³ Eisenlohr,²⁹ and Bristowe,¹² in which careful microscopic examination gave negative results. In character they all differ: the first was recurrent trouble, the second like a bulbar case, while in the third there were signs of Graves' disease and much suggesting hysteria.

The rest of the cases depend on all sorts of gross lesions, as Etter's³¹ with myelitis, Sutter's¹⁵¹ with tumor, Buzzard's¹⁶ with syphilitic endarteritis (?), while the changes occurring in company with tabes, multiple sclerosis, and general paralysis make up the rest.

Dufour²⁴ has summarized the mass of reported cases of ophthalmoplegia externa or nuclear palsies, from which the following figures are taken. Males 122, females 41. Before the fifteenth year, 23; in the next fifteen 35; and from thence to the sixty-ninth year 67 cases. Total, 125. Of 183 cases 31 had previous cerebro-spinal disease, 74 syphilis, diphtheria, diabetes, or the like, and 78 were in health.

Disease at the base of the skull often causes more or less paralysis of the eyes, as in tubercular meningitis and the so-called syphilitic meningitis. As a rule in the first any eye paralysis is of late date, and accompanied by affection of other nerves in a way suggesting a disease of the membranes, as well as by general constitutional symptoms. But this is no law, as the following case of Seitz¹³⁵ proves. A man of forty years went to bed well and woke up in the morning with a complete paralysis of the right third nerve. He later developed the full signs of tubercular meningitis from which he died. The autopsy showed nothing remarkable to explain the early eye paralysis. Syphilitic disease of the membranes is usually in reality a more or less diffuse gummatous or round cell growth, springing from the dura, and often lying between the dura and the skull. By creeping along the base of the skull and crowding the foramina such growths, though of small

mass, can produce great mischief. It is equally true in these cases, as in others of syphilitic origin, that fever is conspicuous by its absence, while nocturnal pain and insomnia predominate. Unverricht's case¹⁵⁸ is a type of how a small amount of tumor can produce much mischief. In the other case the disease at the surface of the base is combined with central trouble depending on disease of the vessels or the neuroglia, as in the case carefully studied by Siemerling.¹⁴⁰

Other tumors in the same region produce the same effects, but tend by pressure to cause paralyses of the body as well as optic neuritis. They also tend to a unilateral distribution, to picked paralysis of the fifth nerve, with neuralgia, as well as to involve the nerves in series as they run along the base of the skull.

There are still but few cases of recurrent paralysis of a third nerve with autopsy reported. (Richter,¹²⁰ Weiss,¹⁶³ Fiedler²⁵ two). In all of these, in spite of the various theories advanced, some form of local disease of the nerve has been found as tubercle, fibroma, meningitis. These cases have not been true recurrent paralysis, since there has been a certain amount of paresis between the spells. They are cases of paresis of the third nerve with recurrent exacerbations. The spells are apt to be accompanied or preceded by pain, vomiting, and confusion.

Until lately there has been more or less feeling that the eyes were exempt in cases of multiple neuritis, a position exploded by the cases of Pal,¹⁰⁷ as well as by that of Meyer.⁷⁴ The last case is of special interest, as it partook of the character of an ophthalmoplegia. A man forty-two years old, suffering from chronic bronchitis and bronchiectasis developed a paralysis of all the muscles of the eyeballs and the levators of the lids, but with no paralysis of the pupils. Anesthesia of the cornea, paresthesia of the back and limbs, and dysphagia soon developed, shortly after which death occurred. A careful microscopic examination failed to show any disease of the brain, but did demonstrate an extensive multiple neuritis. The third, fourth, and sixth nerves were degenerated, while the facials,

hyoglossals, glossopharyngeals and many spinal nerves were partially degenerated.

In disease of the orbit the paralysis may be general, according to accepted doctrine, or localized in certain branches of the third nerve; but our knowledge of the subject is very meagre. The foramina themselves offer opportunity for trouble by the growth of exostoses, while fracture is not a rare cause of trouble. With so-called rheumatic paralyses of the eye muscles, so commonly referred to, I have had little or no experience. Of some fifty or sixty cases of which I have records, there is but one which can fairly be considered as belonging to this group if it exist. This case was seen but once, and was so classed from lack of any indications. It goes without saying that the probabilities of syphilis were great. The only autopsy made in the allied facial trouble (Minkowski⁹⁰) revealed a general degeneration of the whole nerve, and no signs of rheumatism. Had other nerves been affected, the case would have been one of multiple neuritis.

There are a few other factors which require mention from the danger of their being overlooked, as congenital imperfections of motion due to paralysis, as in the cases of conjugate paralysis reported by Graefe⁴⁶ and others, to imperfect insertion of the muscles or, to disease in the muscles and tissue of the orbit. Of the latter I have seen one case (following influenza) in which there was much limitation of motion of the eyeballs, intense pain, deep tenderness, fever, pupils not affected, which recovered in ten days.

Ptosis, though not due to paralysis of a muscle of an eyeball is so closely connected with these as to require notice. The lid is raised by two muscles, the levator palpebræ supplied by the third nerve and unstripped fibres supplied by sympathetic fibres. Paralysis of the latter is not so very rare, judging from the slight dropping of the lid during a spell of hemicrania, and in tabetics. A slight congenital drooping of the upper lid is also by no means uncommon. This state is of importance chiefly from the possibility of its being mistaken for a true ptosis. The obverse condition is seen in the failure of the lid

to follow the pupil down and the wide palpebral fissure of Graves' disease.

True ptosis is a different affair and is a sign of importance as a danger signal rather than as a factor in diagnosis. It is commonly present in the early stages of hemiplegia from any cause, and has much the same significance as conjugate deviation of the eyes. Some writers have endeavored to localize a special centre for the lid in the temporal region, but have failed to make out a strong case. Barring the cerebral cases, ptosis occurs with paralysis of the third nerve, from almost any cause, and is often the first sign. A patient wakes up with slight drooping of one lid, and in the course of a few hours to months the other parts supplied by the third nerve are involved. Either the nerve to the lid is more exposed to disease, or owing to its position and constant work defects in the muscle are more easily recognized. However this may be, a picked paralysis of one muscle supplied by the third nerve is very rare and quite surely will be followed by others. The danger is that the physician may overlook or slight the paralysis and thus receive a disagreeable surprise.

No reference has been made to treatment, since, with so many different processes involved it would open up a wide field. The process causing the paralysis is the object to be aimed at, not the paralysis. My own feeling is that where the cause is not apparent, an eye paralysis is very apt to be of syphilitic origin, and as such to suggest antisyphilitic treatment. There is little pathological evidence at hand, but this view seems in accord with the growing sentiment of those who have paid most attention to the subject. Unfortunately it does not follow that because an eye paralysis has syphilitic basis, treatment will do any good.

To sum up.

1. All cases of lateral conjugate paralysis are of central origin.

2. When the paralysis is on the same side as other paralysis the lesion is on the opposite side of the brain. Such paralyzes as a rule are transitory and follow almost any sud-

den lesion, and often only show themselves as a prevailing position of the eye, and not as a true paralysis or even paresis.

3. When the paralysis is crossed with the paralyses below, the lesion is in the pons-medulla region.

The above three are equally true of spasms.

4. A gradual development of conjugate paralysis clearly points to the region of the sixth nucleus of the same side as affected.

5. Paralysis of up or down motions or both motions indicate disease in the region of the corpora quadrigemina, at the point of exit.

6. Reasoning from analogy, paralysis of convergence points to disease in the central gray below the aqueduct, but as yet autopsies are lacking.

7. Picked paralysis of parts of a third nerve strongly suggests central disease, but is not proof of it.

8. A majority of the cases of eye paralysis occur in the syphilitic.

9. A paralysis which changes rapidly, quickly showing fatigue, is probably central in origin.

10. Transitory paralysis in the syphilitic is strongly suggestive of future tabes.

11. An eye paralysis, however simple it may seem, is always a just cause for suspicion of trouble to come, and demands a prompt and thorough examination of the patient.

12. There is no evidence that there is any form of connection between the sixth nucleus and the third, except in the cerebrum.

BIBLIOGRAPHY.

1. Ballet.—*Le Progrès Médical*, p. 766, 1880.
2. Banham—*Lancet*, p. 588, 1884.
3. Barel.—*Archives d'Ophthalmologie*, vii, 503.
4. Bennett and Saville.—*Brain*, xii, 102.
5. Bernhardt.—*Berliner klin. Wochenschr.*, pp. 143, 157, 1881.
6. Bernhardt.—*Berliner klin. Wochenschr.*, p. 1009, 1889.
7. Binsle.—*Deutsch. militär-ärzt. Zeitschr.*, xviii, 301.
8. Bleuler.—*Deutsches Archiv f. klin. Med.* xxxvii, 527, xxxviii, 28.
9. Blocq et Guinon.—*Archives de méd. exper.*, iii, 74.
10. Böttiger.—*Archiv. f. Psych.*, xxi, 513.
11. Bouveret et Curtillet.—*Lyon médical*, lxxv, 35.
12. Bristowe.—*Brain*, viii, 313.
13. Broadbent.—*Med. Times and Gazette*, i, 554, 1872.
14. Bruns —*Neurol. Centralblatt*, p. 151.
15. Buttersack.—*Archiv. f. Psych.*, xvii, 603.
16. Buzzard.—*Brain*, v, 34.
17. Christ.—*Deutsches Archiv f. klin. Med.*, xlvj, 497.
18. Claes.—*Berliner klin. Wochenschr.*, No. 37, 1891.
19. Debove.—*Bull. de la soc. anat.*, p. 422, 1874.
20. Besnos.—*Bull. de la soc. méd. des hôp.*, x, 87.
21. De Watteville.—*Neurolog. Centralblatt*, d. 217, 1887.
22. Dittmann.—*Neurolog. Centralblatt*, d. 426, 1889.
23. Buboy's.—*Bull. clin. nat., ophthalm.*, p. 121, 1882.
24. Dufour.—*Les paralysies nucléaires des muscles des yeux.*
25. Earles.—*Trans. Ophthalm. Soc.*, iv, 300.
26. Eichhorst.—*Charité-Annalen.*, p. 206, 1874.
27. Eichhorst.—*Corr.-blätt. f. schweiz. Aerzt.*, xix, 432.
28. Eichhorst.—*Charité-Annalen.*, p. 224, 1874.
29. Eichhorst.—*Neurolog. Centralblatt*, Nos. 15, 16, 1887.
30. Essmarch und Jessen.—*Allg. Zeitschr. f. Psych.*, p. 20, 1857.
31. Etter.—*Corr.-blätt. f. schweiz. Aerzt.*, xii, 769.
32. Féréol.—*Gazette des hôp.*, x, 98.
33. Féréol.—*Bull. de la soc. méd., des hôp.*, p. 125, 1873.
34. Fiedler.—*Jahresbericht f. Ophthalmol.*, xviii, 585.
35. Fiedler.—*Centralblatt f. Nervenheilk.*, p. 491, 1887.
36. Finlayson.—*Glasgow Med. Jour.*, April, 1888.
37. Finny.—*Dublin Jour. Med. Sc.*, lxxxvii, 380.
38. Foville.—Quoted by Graux.
39. Garel.—*Revue de méd.*, p. 593, 1882.
40. Gayet.—*Archives de physiol.*, vii, 341.
41. Gayet.—*Gazette hebdom.*, p. 262, 1876.
42. Gee.—*St. Barthol. Hosp. Rep.*, xxvi, 106.
43. Gowers.—*Diseases of the Nervous System*, ii, 176, 1st ed.
44. Gräfe.—*Handbuch d. gesamt. Augenheilk.*, vi, 1875.
45. Gräfe.—*Verhandl. internat. ophthalmol. Congress.*, p. 30.
46. Gräfe.—*Archiv. f. Ophthalmol.*, viii, 2te ab., p. 74.

47. Grasset.—Montpellier méd., xl, 323.
48. Graux.—Thèse de Paris, 1878.
49. Gubler.—Schmidt's Jahrbüch., lvii, 299.
50. Gubler.—Gazette hebdom., p. 721, 1858.
51. Gull.—Med. Times, xix, 371.
52. Hallopeau.—Archives de physiologie, viii, 794.
53. Hallopeau.—Bull. de la soc. anat., 1876.
54. Henoch.—Berliner klin. Wochenschr., p. 125, 1864.
55. Hensen und Völckers.—Archiv. f. Ophthalmol., xxiv, 1.
56. Heubner.—Dieluetische Erkrankungen der Hirnarterien.
57. Heuser.—Virchow's Archiv., cx, 9.
58. Hirschberg.—Neurolog. Centralblatt, No. 24, 1882.
59. Hoppe.—Neurolog. Centralblatt, p. 628, 1888.
60. Hück.—Monatsblatt, f. Augenheilk., July, 1879.
61. Huguenin und Hofstetter.—Zur Casuistik der Ponstumoren.
62. Hunnius.—Zur Symptomatologie der Brückenerkrankungen.
63. Husner.—Prager. med. Wochenschr., p. 59, 1883.
64. Hutchinson.—Med. Chir. Trans. lxii, 307.
65. Hutchieson, Jr.—Lancet, p. 115, 1887.
66. Josephs.—Zeitschr. f. klin. med., xvi, 349.
67. Kahler und Pick.—Vierteljahrschr. f. d. prakt. Heilkunde, cxlii, 87.
68. Kahler und Pick.—Zeitschr. f. Heilkunde, p. 301, 1881.
69. Kahler und Pick.—Archiv. f. Psych., x, 334.
70. Keen.—Amer. Jour. Med. Sci., lxxxviii, 329.
71. Köchlin.—Thèse de Paris, 1858.
72. Lancereaux.—Des affections nerveuses syphilitiques.
73. Lenbe.—Deutsches Archiv f. klin. Med., xl, 217.
74. Leyden.—Klinik der Rückenmarkskrankheiten, ii, 65.
75. Lichtheim.—Cor.-blätt. f. schweiz. Aerzte, xii, 2.
76. McAlldowie.—Brain, iii, 125.
77. McGregor.—Lancet, Dec. 11, 1886.
78. Manz.—Berliner klin. Wochenschr., p. 637, 1885.
79. Marot.—Bull. de la soc. anat., p. 189, 1875.
80. Martin.—Bull. de la soc. anat., p. 152, 1877.
81. Mauthner.—Die Lehre von der Augenmuskellähmungen.
82. Mendel.—Deutsch. med. Wochenschr., p. 124, 1885.
83. Mendel.—Neurolog. Centralblatt, p. 128, 1885.
84. Meyer.—Neurolog. Centralblatt, vii, 180.
85. Meyer.—Archiv f. Psych., xiii, 63.
86. Mierzejewsky und Rosenbach.—Neurolog. Centralblatt, p. 361, 1885.
87. Miles.—Archives of Med., vi, 196.
88. Mills.—Archives of Med., viii, 60.
89. Mills.—Jour. Nerv. and Ment. Dis., viii, 470.
90. Minkowski.—Berliner klin. Wochenschr., p. 665, 1891.
91. Möbius.—Münch. med. Wochenschr., p. 91, 1888.
92. Möbius.—Centralblatt f. Nervenheilk., p. 449, 1887.
93. Möbius.—Berliner klin. Wochenschr., p. 604, 1884.
94. Moeli.—Archiv f. Psych., xviii, 1.

95. Mott and Schæfer.—Brain, p. 164, 1890.
96. Mott and Schæfer.—Brain, p. 174, 1890.
97. Neumann.—Berliner klin. Wochenschr., p. 403, 1890.
98. Nieden.—Centralblatt f. Augenheilk., iv, 209.
99. Nothnagel.—Wien. med. Blätter, No. 19, 1884.
100. Nothnagel.—Topische Diagnostik der Gehirnkrankheiten.
101. Nothnagel.—Zeitschr. f. klin. med., xvi, 424.
102. Oppenheim.—Archiv f. Psych., xvi, 707.
103. Oppenheim.—Archiv f. Psych., xx, 131.
104. Oppenheim.—Charité-Annalen., x, 334.
105. Ormerod.—Trans. Path. Soc. Lond., xi, 21.
106. Ormerod.—Lancet, i, 564, 1884.
107. Pal.—Ueber multiple Neuritis.
108. Parinaud.—Trans. Brain, ix, 330.
109. Parinaud.—Gazette hebdom., p. 727, 1877.
110. Parinaud.—Archives de neurol., v, 145.
111. Perlia.—Archiv f. Ophthalmol., xxxv, 287.
112. Peters.—Centralblatt f. prakt. Augenheilk., xii, 225.
113. Petrina.—Prag. Vierteljahrschr. f. prakt. Heilk., 1877.
114. Pflüger.—Archiv f. Ophthalmol., xxxvii, 71.
115. Pilz.—Jahrbuch. f. Kinderheilk., n. f., iii, 133.
116. Poltke.—Archiv f. Psych., x, 205.
117. Poubin.—Le progrès méd., p. 186, 1880.
118. Prévost.—Thèse de Paris, 1868.
119. Quiock.—Lyon méd. p. 313, 1881.
120. Richter.—Archiv. f. Psych., xviii, 259.
121. Rickards.—Lancet, i, 774, 1886.
122. Romberg.—Casper's Wochenschr., p. 6, 1842.
123. Ross.—Brain, vii, 501.
124. Roussel.—Le progrès méd., lxxxvi, 593.
125. Sängcr.—Archiv f. Psych., x, 158.
126. Samelsohn.—Verhandl. internat. ophthalmol. Congress, p. 39, 1888.
127. Samelsohn.—Deutsche med. Wochenschr., No. 46, 1888.
128. Sandby.—Lancet, ii, 345, 1882.
129. Saundby.—Birmingham Med. Review, p. 222, 1885.
130. Schæfer.—Brain, x, 362.
131. Schapringcr.—N. Y. med. Monatsheft, p. 621, 1889.
132. Schutz.—Prag. med. Wochenschr., p. 361, 1881.
133. Schwartz.—Zeitschr. f. klin. med., xiv, 293.
134. Seguin.—Jour. Nerv. and Ment. Dis., xv, 317.
135. Seitz.—Die Meningitis tuberculosa der Erwachsenen.
136. Senator.—Archiv f. Psych., xiv, 643.
137. Sharkey.—Trans. Ophthalmol. Soc., iv, 276.
138. Sharkey.—Trans. Ophthal. Soc., viii, 314.
139. Shaw.—Brain, v, 251.
140. Siemerling.—Archiv f. Psych., xix, 401.
141. Simon.—Brit. Med. Jour., Jan. 2, 1886.
142. Smith, Priestley.—Ophthalmol. Hosp. Rep., viii, 185.

143. Snell.—Lancet, i, 138, 1885.
144. Spitzka.—Jour. Nerv. and Ment. Dis., xiii, 193.
145. Spitzka.—Jour. Nerv. and Ment. Dis., xiii, 413.
146. Starr.—Jour. Nerv. and Ment. Dis., xv, 201.
147. Steffen.—Berliner klin. Wochenschr., p. 128, 1864.
148. Sticker.—Münch. med. Wochenschr., p. 987, 1887.
149. Stiebel.—Paralyseos hæmorrhagicæ nervi oculo-motorii in infante observatus casus rarissimus.
150. Stölting und Bruns.—Archiv. f. Ophthalmol., xxxiv, 92.
151. Sutter.—Casuistischer Beitrag zur Lehre der Ophthalmoplegien.
152. Swanzy.—Wien. med. Presse, p. 1604, 1889.
153. Tassi.—Revista sper. di freniatria, xii, 72.
154. Thomsen.—Archiv f. Psych. xviii, 616.
155. Thomsen.—Arch. f. Psych., xix, 185.
156. Thomsen.—Centralblatt f. Nervenheilk., p. 531, 1884.
157. Uhthoff.—Archiv. f. Psych., xxi, 55, 377.
158. Unverricht.—Fortschr. d. Med., p. 791, 1887.
159. Vincentiis.—Annali di Oftalmol., xiii, 274.
160. Warner.—Med. Chir. Trans., lxvi, 107.
161. Webber.—Boston Med. and Surg. Jour., 8 March, 1853.
162. Weber.—Med. Chir. Trans., xlv, 121.
163. Weiss.—Wiener med. Wochenschr., p. 522, 1885.
164. Wernicke.—Archiv. f. Psych., xx, 243.
165. Wernicke.—Archiv f. Psych., vii, 513.
166. Wernicke.—Berliner klin. Wochenschr., p. 394, 1876.
167. Wernicke.—Lehrbuch der Gehirnkrankheiten, ii, 233.
168. Westphal.—Archiv f. Psych., xviii, 846.
169. Westphal und Siemerling.—Archiv f. Psych., xxii, Supp. Heft.
170. Willocks.—Brit. Med. Jour., p. 272, 1881.
161. Wollenberg.—Archiv f. Psych., xxi, 778.

—*Boston Medical and Surgical Journal.*

THE AMERICAN JOURNAL

OF

OPHTHALMOLOGY.

VOL. IX.

ST. LOUIS, MO., JANUARY, 1892.

No. 1.

Edited by ADOLF ALT, M.D.,

3036 Locust Street, St. Louis, Mo.,

IN CONJUNCTION WITH

R. S. C. AYERS, Cincinnati.
R. F. BULLER, Montreal.
R. B. E. FRYER, U.S.A., Kansas City.
R. J. GREEN, St. Louis.
R. E. GRUENING, New York.
R. F. C. HOTZ, Chicago.
R. L. HOWE, Buffalo.
R. CH. J. KIPP, Newark.
R. SWAN M. BURNETT, Washington.

DR. J. C. LUNDY, Detroit.
DR. T. R. POOLEY, New York.
DR. J. S. PROUT, Brooklyn.
DR. G. STRAWBRIDGE, Philadelphia.
DR. S. THEOBALD, Baltimore.
DR. W. THOMSON, Philadelphia.
DR. S. J. B. VERNYNE, New Bedford.
DR. O. F. WADSWORTH, Boston.
DR. D. WEBSTER, New York.

CONTENTS:

ORIGINAL ARTICLES.

TRANSLATION.

On the Use of Thiersch Flaps in the Treatment of Trichiasis and Entropium.—H. GIFFORD, M.D. 1
Cases of Traumatic Hæmorrhage into the Eyeball Without Lesion of the External Tunicæ —G. STERLING RYERSON, M.D., L.R.C.S. 8
Asmodie Mydriasis a Sexual Neurosis —S. MITCHELL, M.D. 11
Note on Dr. S. C. Ayres' Chalazion-Forceps.—ADOLF ALT, M.D. 12

The Treatment of Blepharitis, of Ectropium after Blepharitis, and of Ectropium Senile et Sarcomatosum. 13

SELECTIONS.

Tumors of the Orbit, Secondary or Consecutive to Tumors of the Neighboring Bony Cavities. 19

TERMS, PER YEAR, - - - - - \$3.50.

J. H. CHAMBERS & CO.,
PUBLISHERS AND DEALERS IN MEDICAL BOOKS,
914 LOCUST STREET, ST. LOUIS, MO.

Entered at the Post-Office at St. Louis, Mo., as Second-Class Matter.



CH. MARCHAND'S PEROXIDE OF HYDROGEN

(MEDICINAL) H_2O_2 (ABSOLUTELY HARMLESS.)

**Most powerful bactericide and pus destroyer.
Endorsed by the medical profession.
Uniform in strength, purity, stability.
Retains germicidal power any length of time.
Taken internally or applied externally with
perfect safety.**

Send for free book of 72 pages, giving articles by the following contributors:

DR. JOHN V. SHOEMAKER, Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia, Pa. "Peroxide of Hydrogen." *Materia Medica and Therapeutics*, Vol. II., 1891.

DR. J. H. DeWOLF, of Baltimore, Md. "Medicinal Peroxide of Hydrogen and Glycozone." *Southern Medical and Surgical World* of Baltimore, Md.

DR. ROBERT T. MORRIS, of New York. "The necessary Peroxide of Hydrogen." *The Journal of American Medical Association*, Chicago, Ill.


NOTE.—Avoid substitutes—in shape of the commercial article bottled—unfit and unsafe to use as a medicine.

Ch. Marchand's Peroxide of Hydrogen (Medicinal) sold only in 4-oz., 8-oz., and 16-oz. bottles, bearing a blue label, white letters, red and gold border, with his signature. Never sold in bulk.

Physicians willing to pay express charges will receive free sample on application.

PREPARED ONLY BY

Charles Marchand

 Mention this publication.

Chemist and Graduate of the "Ecole Centrale des Arts et Manufactures de Paris" (France).

SOLD BY LEADING DRUGGISTS.

Laboratory, 10 West Fourth Street, New York.

"FOCULISTS"

Before buying your case of

TEST LENSES,

CORRESPOND WITH US.

OUR NO. 9 COMPLETE CASE WITH COMPOUND FRAME,

\$60.00 NET CASH,

Including a Maddock's Muscular Test.

Privilege of Examination.

E. S. & W. S. FOWLER,

8 E. MADISON STREET,

CHICAGO, ILL.

SPECIAL NOTICE!!!

Medical Books.

Our facilities are such that we can furnish any Medical books to the Profession at Lowest Prices. IT WILL PAY to correspond with us before making your purchases.

J. H. CHAMBERS & CO.,

Publishers and Dealers in Medical Books,

914 Locust Street,

ST. LOUIS, MO.

The Use of Compressed and other Discs in Ophthalmic Practice.

ALTHOUGH solid remedies are, in ophthalmic practice, commonly used in solution, or as finely triturated powders in the form of ointments, there are many cases where they could with better effect be employed alone, or in mixtures with other solids. When a solution of a drug—atropine sulphate for example—is instilled drop by drop into the conjunctival sac—which, by the way, holds not more than a single drop—at least ninety per cent. of it runs through the nasal duct into the nose and naso-pharynx or mingling with a superabundance of tears, flows over the margin of the lower lid upon the face. This is to say, to obtain the effect upon the eye of 1-100 grain of Atropia, 1-10 of a grain in watery solution must be introduced into the conjunctival sac. Aside from the waste of material,—a matter for consideration when using such alkaloids as Homatropine, that cost seventy five cents a grain,—the absorption of the remedy by the naso-pharyngeal mucous membrane, may not be desirable, as in the case of Atropia, Cocaine, Hyoscin, Veratria, and other powerful poisons. It occurred to me some time ago, that Ophthalmic Discs could be more cheaply and more efficiently manufactured by our own chemists, and for some time past I have been experimenting, with the idea that they might possibly prove of service to those who found it desirable to use this kind of medication. I chose the form that Messrs WYETH & BROTHER have so successfully made use of in their Hypodermic Tablets, and, after trying a variety of excipients—among them dextrin, linseed jelly, gum acacia, Irish moss, quince-seed jelly, marshmallow jelly, gum tragacanth, and the various kinds of gelatine, all these alone and mixed with boric acid—I concluded that the latter combination best suited the general purpose I had in view. To this, however, I make one exception, viz.: the use of Cocaine and mixtures of it. I found that in consequence of the desiccating effects of that agent upon the corneal epithelium, it was not safe to use it in the disc form unless it were combined with gelatine alone or in a combination of which gelatine formed the greatest proportion, because when used with other excipients it is very liable to cause an annoying abrasion of the cornea.

I claim for them the following advantages in cases suitable for their administration. The WYETHS have prepared for me a large variety of both kinds from formulæ I submitted to them.

First.—Slow, regular, and complete solution in the conjunctival sac.

Second.—The exhibition of a definite dose, the full effect of which may be looked for.

Third.—Unlike solutions and ointments they do not lose their strength or decompose in a few days or weeks, but may be kept many months.

Fourth.—The cost of the gelatinous form is, I understand, less than the imported French and English makes, and I believe they are in many respects superior to the latter.

Fifth.—I have found the Compressed Discs when employed in suitable cases, to be non-irritant and readily soluble.

Sixth.—The effect of both forms will be found to be many times greater than the corresponding solutions. I think the efficacy of a Disc containing 1-1000 grain of Atropine to be equal to one drop of a one per cent. aqueous solution of that drug, although nominally, the latter is ten times as strong.

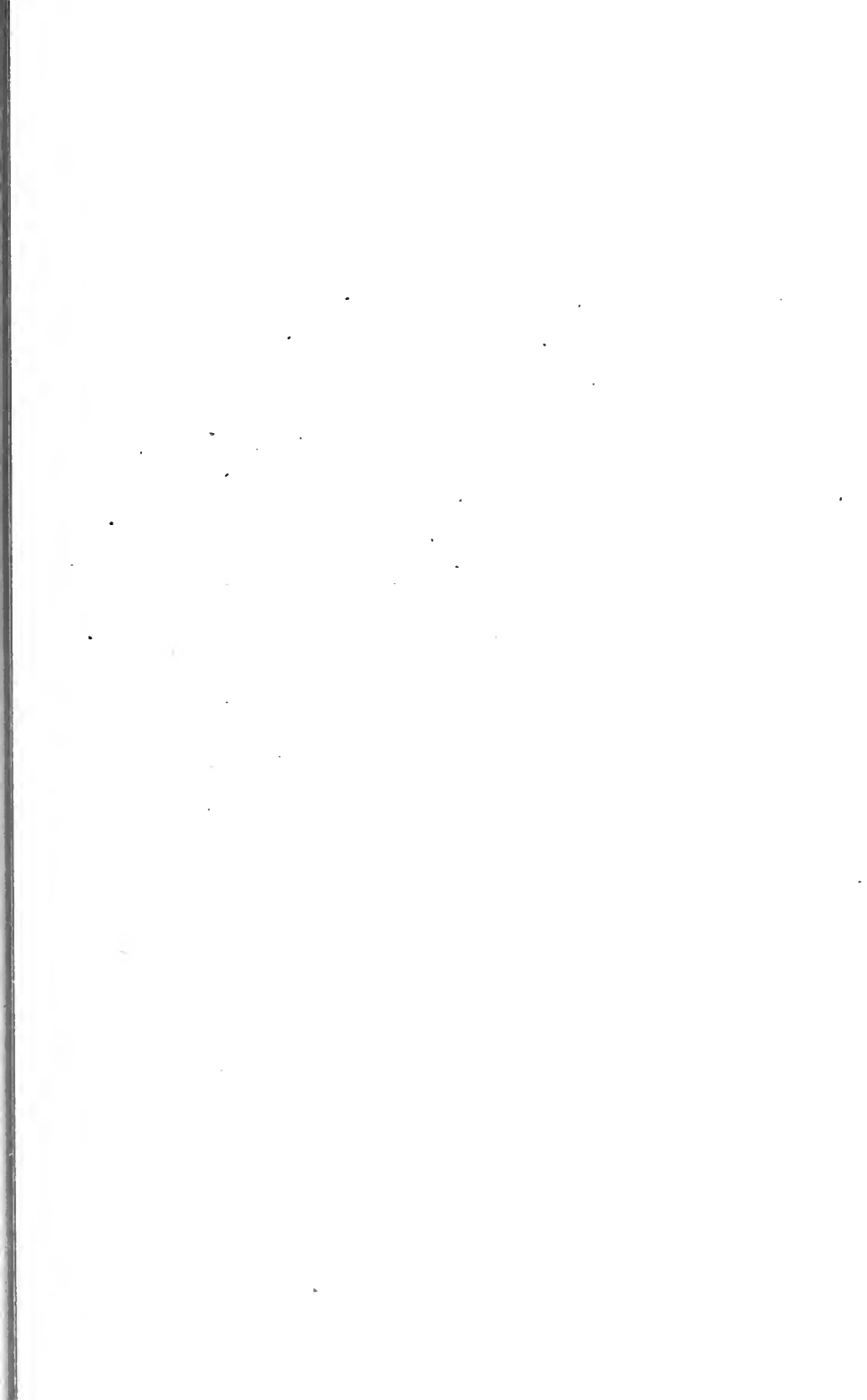
Seventh.—The portability of these Discs has something to recommend them, as the surgeon may if need be, carry about an assortment of these Discs for the treatment of ocular affections.

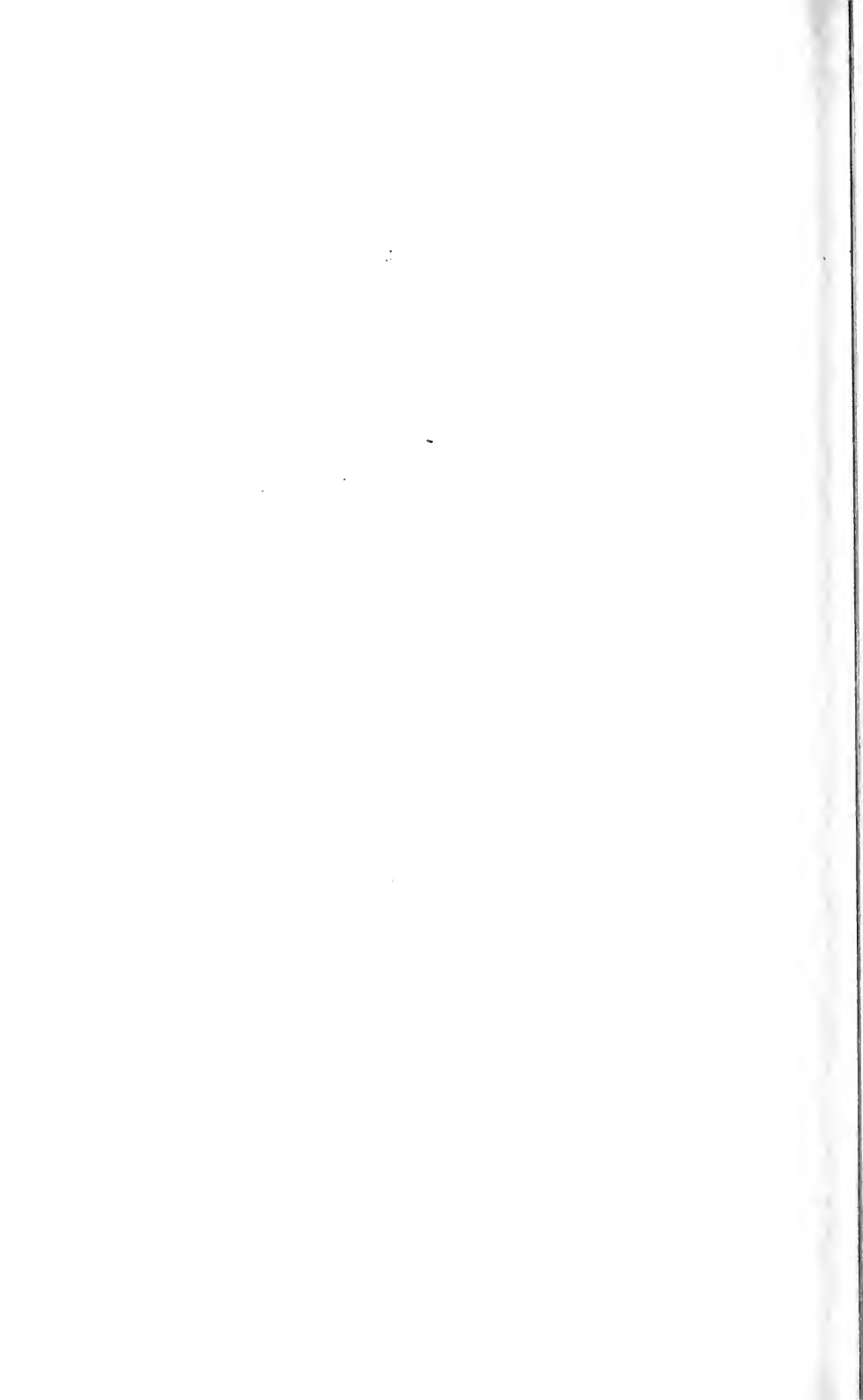
Eighth.—Finally, their application is simple enough: Having dampened a small camel's-hair brush, touch with it a Disc placed on a piece of clean, dry paper, when drawn down and the Disc is placed against the scleral conjunctiva, towards the outer canthus, the Disc will readily stick to the brush. The patient is now told to look up, the lower lid is raised. The eye is now closed until the Disc becomes softened and partially absorbed.—CASEY A. WOOD, C.M., M.D.—(Read before the Chicago Medical Society, July 16, 1891).

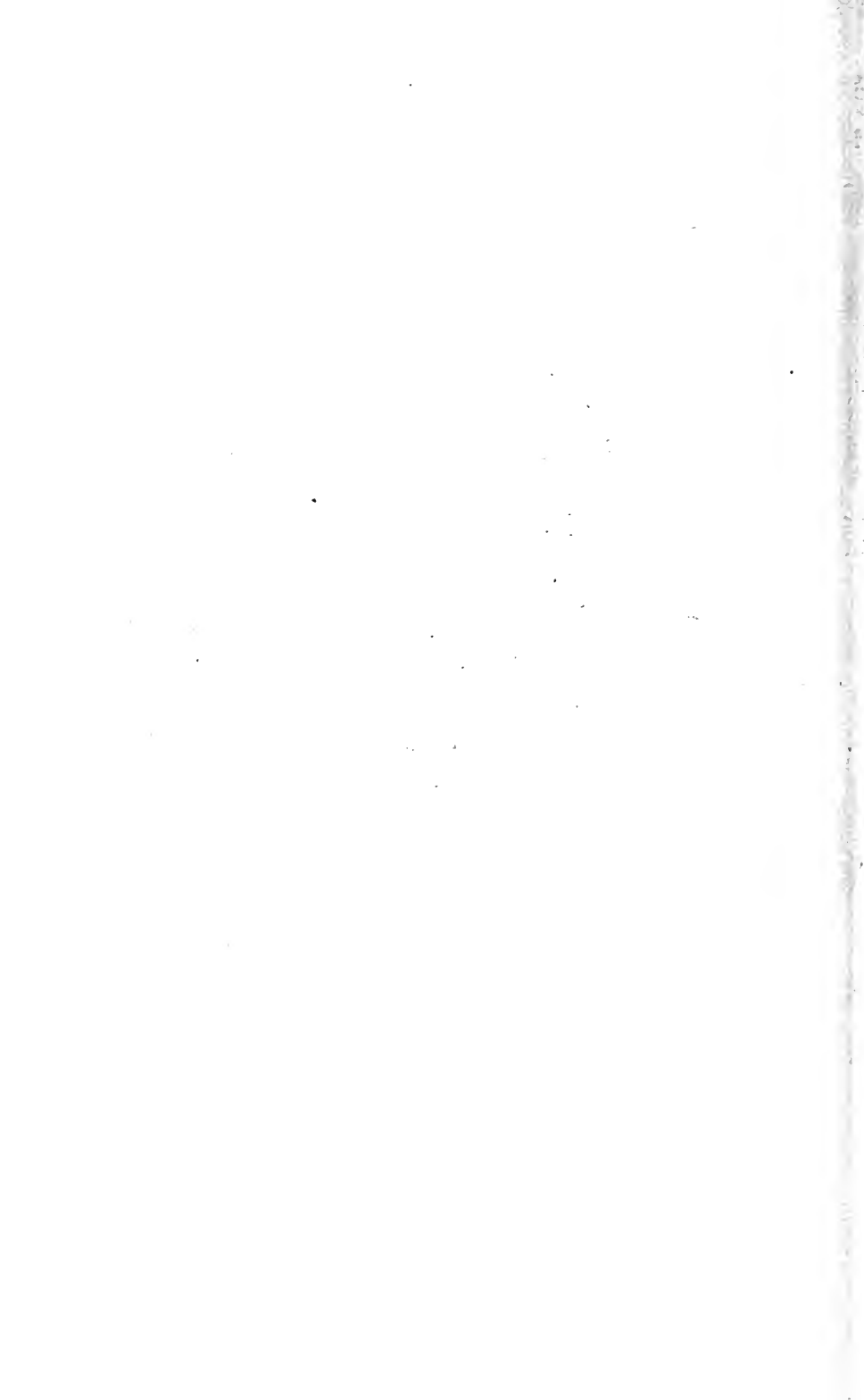
Dr. Wood's complete article on Ophthalmic Discs, with samples, will be mailed to any physician who may desire them.

--: MANUFACTURED BY --:

JOHN WYETH & BROTHER, PHILADELPHIA.







RE
1
A5
v.9

American journal of ophthal-
mology

GERSTS

